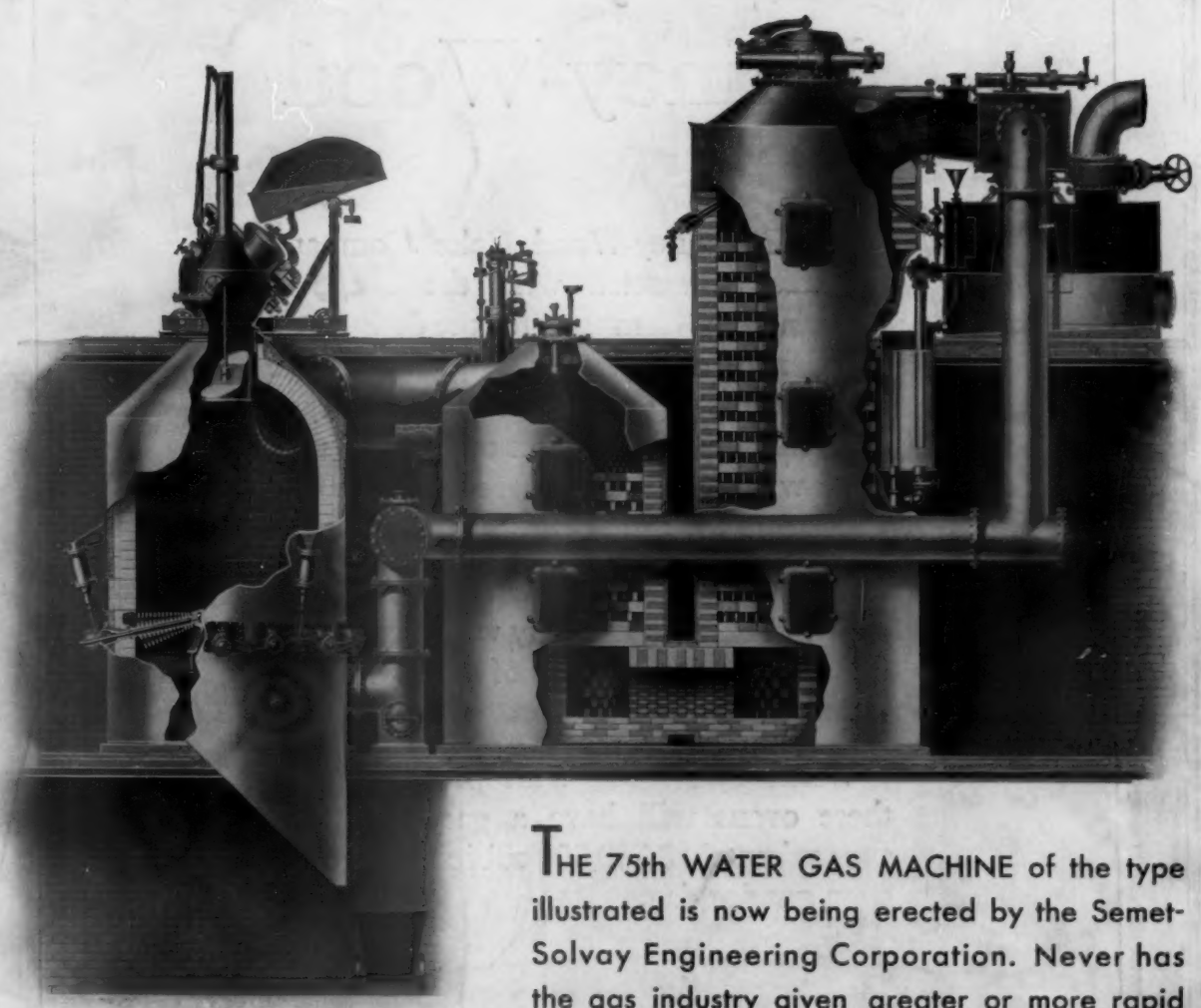
Vol. 131. No. 3 SEPTEMBER, 1929 Price 25 Cents

SEP 19 1929
Smithsonian Deposit

AMERICAN GAS JOURNAL

Established 1859 Pioneer of the Gas Industry

Including GAS INDUSTRY Est. 1900



THE 75th WATER GAS MACHINE of the type illustrated is now being erected by the Semet-Solvay Engineering Corporation. Never has the gas industry given greater or more rapid indorsement to any plant equipment < < <

SEMET - SOLVAY ENGINEERING CORPORATION

DIVISION ALLIED CHEMICAL AND DYE CORPORATION

40 RECTOR STREET NEW YORK, N. Y.

Becker Type Ovens
for
Rainey-Wood

THE Rainey-Wood Coke Company has contracted with the Koppers Construction Company for the design and erection of a battery of by-product coke ovens consisting of forty-one Becker type combination coke and gas ovens. The new work will also include three Koppers Gas Producers for underfiring these ovens.

The forty-one ovens will have a daily coal carbonizing capacity when operating under normal conditions of approximately 770 net tons of coal.

When underfired with producer gas, these ovens will have a gas output of approximately 8,200,000 cubic feet of coke oven gas per day.

The Koppers Construction Company

Koppers Building **Pittsburgh, Penna.**

AMERICAN
GAS JOURNAL
Established 1859 — *Pioneer of the Gas Industry*
Including GAS INDUSTRY Est. 1900

Executive and Editorial Offices, 53 Park Place, New York City

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Vol. 131, No. 3 — September, 1929 — Whole Number 3669

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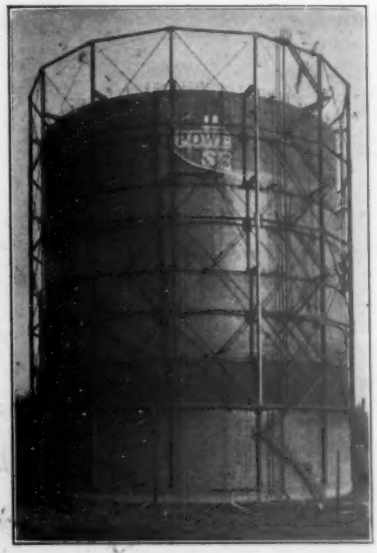
THE STACEY MANUFACTURING COMPANY

The Builders of STACEY *Gas Holders for Seventy-Eight Years*



GAS HOLDERS

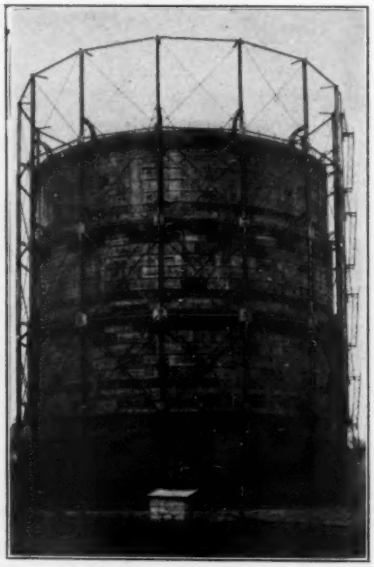
GAS PLANT EQUIPMENT

PURIFIERS

STEEL TANKS

CAST IRON VALVES AND FITTINGS

WELDED STEEL PIPE AND FITTINGS

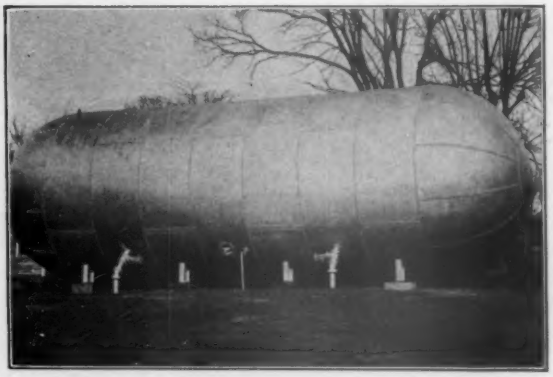


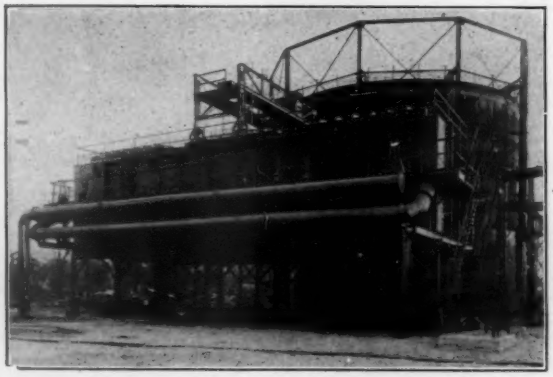
Builders of More Than 1300 Gas Holders

STACEY SINCE 1851

Pioneer Builders of Low and High Pressure Gas Holders

STACEY SINCE 1851





THE STACEY MANUFACTURING COMPANY

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Established 1851 **CINCINNATI, OHIO** *Incorporated* 1880

New York Office: 52 Vanderbilt Ave. Telephone Vanderbilt 1549

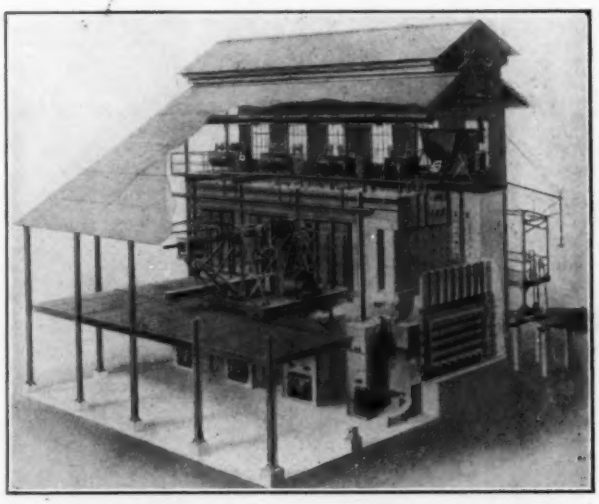
If You Haven't the Gas
You Cannot Sell It!

A requisite of the gas company is to produce gas to sell. The *prime* requisite, however, is to produce gas at the lowest possible cost to realize a profit on the gas produced.

To obtain uniformly good results from proper methods of operation, the plant equipment must be maintained at all times in a uniformly good operating condition.

Sometimes the productive capacity of the equipment is not equal to the demand, which may necessitate readjustment, simple repairs, replacement or complete renovation or rebuilding the plant.

Whatever the cause of reduced productivity, it has to be known, and until it is known to a *certainty,* not guessed at, the plant, if it does not actually lose money, will deprive the gas company of that profit which accrues from low cost production.



Here is where the unbiased survey of an organization of competent engineers can be of inestimable value. They can see with the trained and critical eye of the outsider what those who are living their daily lives close to their work may pass by unnoticed.

We have had unusual opportunities to study every phase of gas-making in our experience of over a quarter century, which enables us to go into your plant, with a free mind and cooperate with your engineers and plant operators to the end that your plant will produce gas at the minimum cost.

Let us cooperate with you for Profitable Production

Improved Equipment-Russell Engineering Corporation

Engineers—Builders

MAIN OFFICE
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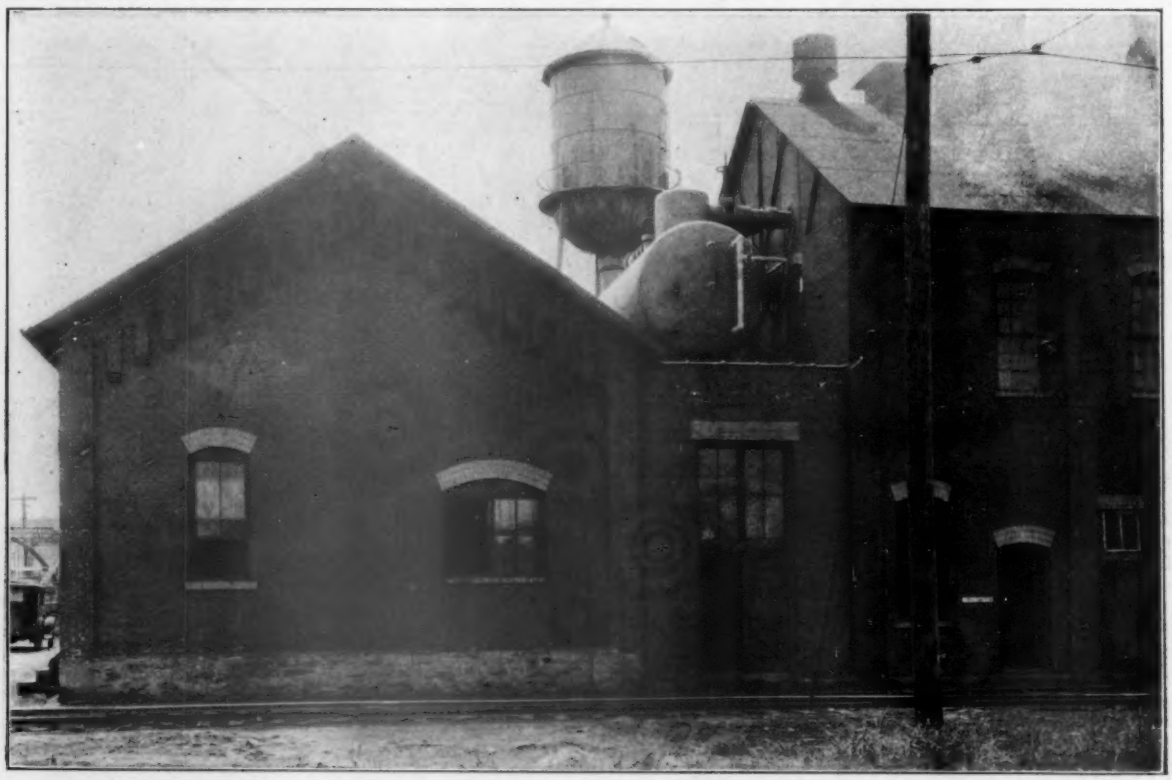
NEW YORK

BRANCH OFFICE
Engineering Bldg., 205 W. Wacker Drive
CHICAGO

SMOOT STEAM ACCUMULATOR



This interesting Smoot Steam Accumulator installation is at the Cedar Rapids Gas Company, Cedar Rapids, Iowa. The Western Gas Construction Company, Engineers.

Recent additions to the long list of gas plants equipped with Smoot Steam Accumulator and Control System.

Consumers Power Company
Lansing, Michigan
Stevens & Wood, Inc., Engineers
United Engineers & Constructors, Inc., Constructors

Consumers Power Company
Jackson, Michigan
Stevens & Wood, Inc., Engineers
Semet-Solvay Engineering Corp., Constructors

Brooklyn Borough Gas Company
Coney Island, N. Y.
The Western Gas Construction Company, Engineers

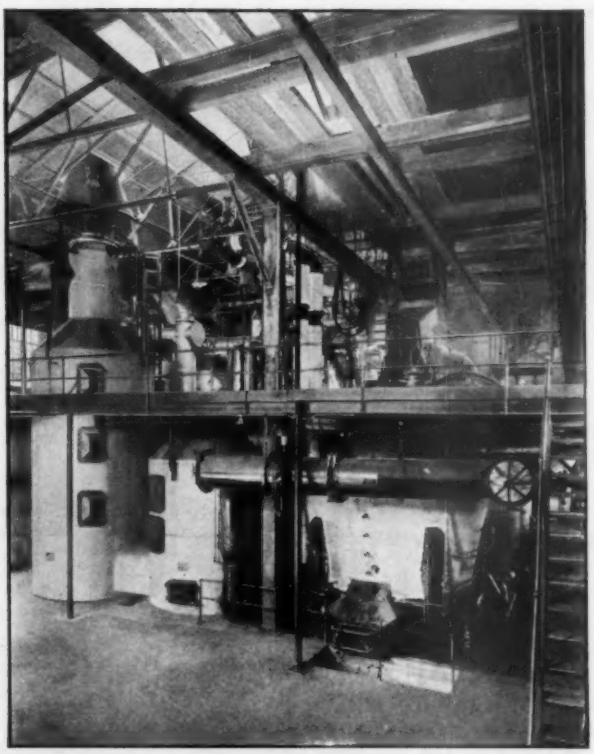
The Public Service Company of Northern Illinois
Gas Station No. 22
Ottawa, Illinois

SMOOT ENGINEERING CORPORATION
136 Liberty Street **New York**

SMOOT CONTROL

THE U.G.I.

MECHANICAL GENERATOR *and* AUTOMATIC FUEL CHARGER



U.G.I. Mechanical Generator Carburetted Water Gas Set and Fuel Charger as installed at New Bedford, Mass.

U.G.I. Mechanical Generators in operation

The Philadelphia Gas Works Company, Philadelphia, Pa.	1
Philadelphia Suburban-Counties Gas and Electric Company, West Conshohocken, Pa.	1
Public Service Electric and Gas Company, Camden, N. J.	1
New Bedford Gas and Edison Light Company, New Bedford, Mass.	1

U.G.I. Mechanical Generators under construction

Consumers Gas Company, Reading, Pa.	1
Philadelphia Suburban-Counties Gas and Electric Company, Chester, Pa.	2
The Philadelphia Gas Works Company, Philadelphia, Pa.	3
E. I. Du Pont de Nemours and Company, Belle, West Virginia	3
TOTAL	13

THE U. G. I. CONTRACTING COMPANY

DIVISION OF

UNITED ENGINEERS & CONSTRUCTORS

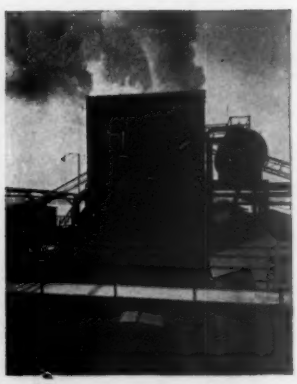
INCORPORATED

DWIGHT P. ROBINSON, PRESIDENT

Broad and Arch Streets, Philadelphia

MAXIMUM RETURN TO CLIENTS PER DOLLAR INVESTED

Yesterday's Methods
Give Way To Today's Improvements



275,000 cu. ft. of steam is wasted to the air for each 10 tons of coke wet quenched.

10,000 lb. of high pressure steam could be produced from this waste by Dry Quenching.

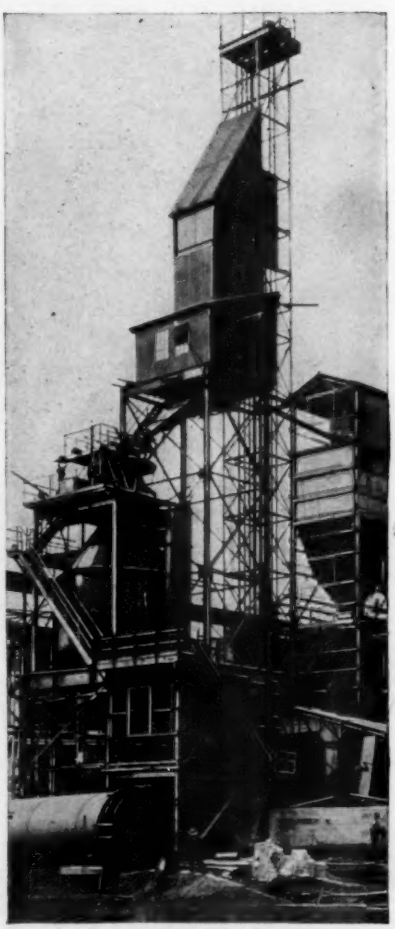
Improved methods demonstrate the cooling of coke by wet quenching to be wasteful of heat, destructive of hot coke cars and injurious to plant steelwork.

Dry Quenching, the modern method of cooling coke, removes these disadvantages.

By Dry Quenching the heat in the hot coke is converted into useful energy—high pressure steam. Using no water, the damage to hot coke cars is eliminated and no corrosive vapors are released to injure plant steelwork.

Dry Quenching of coke is a step forward in coke quenching practice.

Literature describing and illustrating the Sulzer Dry Quenching system is available to those interested in cooling coke.



A typical Dry Quenching installation

DRY QUENCHING EQUIPMENT CORPORATION

International Combustion Building . 200 Madison Avenue, New York, N.Y.

A SUBSIDIARY OF INTERNATIONAL COMBUSTION ENGINEERING CORPORATION

Positive *and* Economical Treatment of Tar Emulsions

APPARATUS

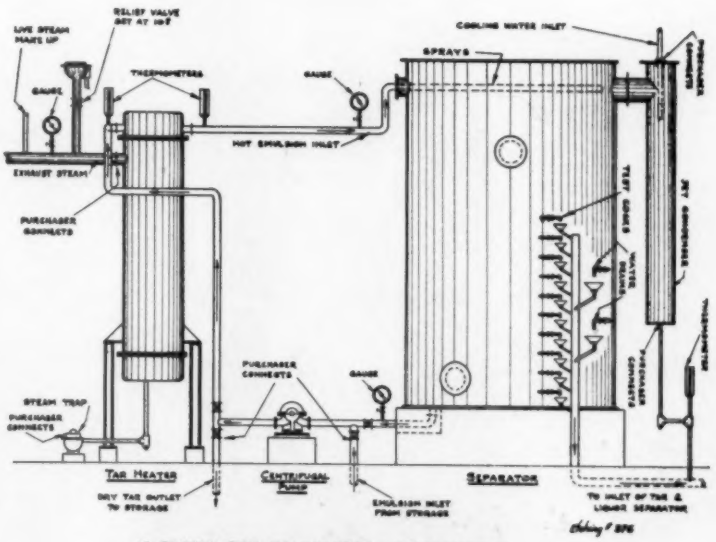
1— Separating Tank which contains Emulsions to be treated.

2— A circulating pump.

3— A heat exchanger using exhaust steam.

4— Separating sprays in top of separating tank.

5— A small Jet Condenser for condensing small amounts of light oil and water vapor.



KLEINMAN TAR DEHYDRATOR – ILLUSTRATIVE.
PATENT APPLIED FOR

PROCESS

1—Pumping to a pressure which gives 5 pounds per square inch at the spray nozzles.

2—Heating Emulsion to about 220° F.

3—Emulsion leaves sprays reducing the pressure causing some of the water to flash into steam which breaks up the emulsion *without foaming.*

4—Mechanical separation in the separating tank.

5—Drawing off separated water.

6—Drawing off tar to dry tar Storage.

RESULT

A dry tar containing about 1% moisture.

Low Operating Costs

Send for full details of design and operation of this Positive and Economical Process.

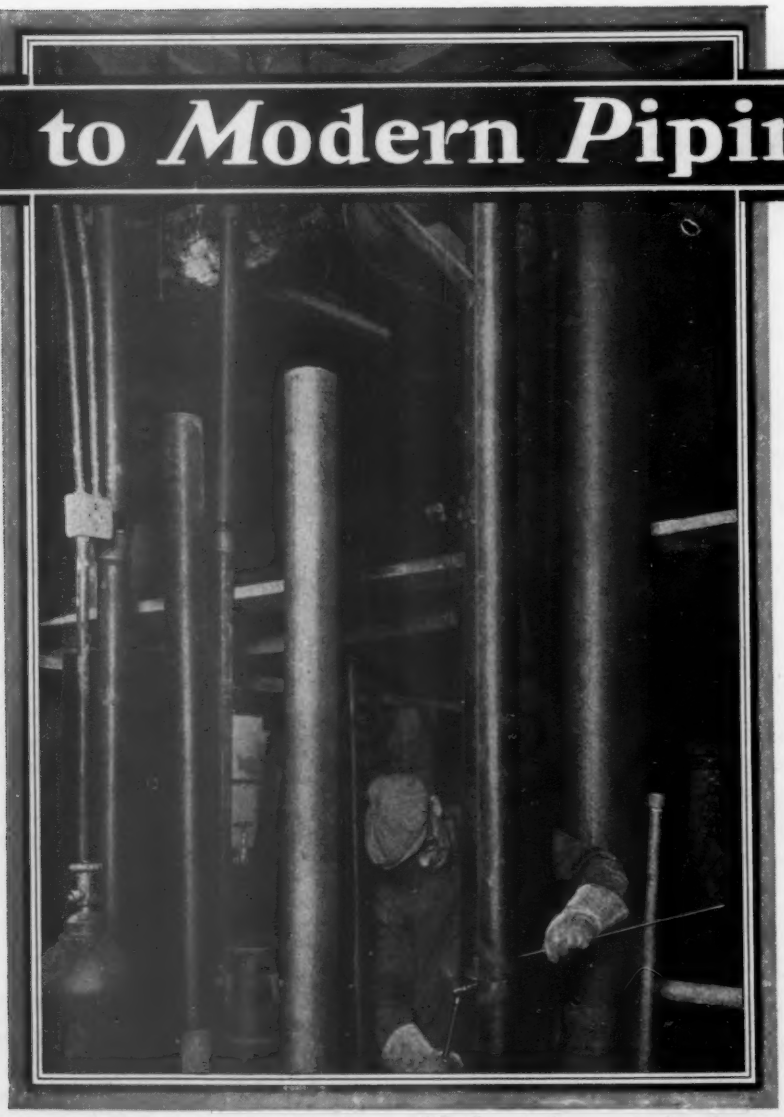
THE GAS MACHINERY COMPANY

CLEVELAND, OHIO

New York Office 812 Graybar Building

E. E. Witherby, Eastern Representative

..As to Modern Piping..



PROGRESSIVE engineers recognize Oxwelded piping as the best modern practice. Oxwelded joints are leakproof. Maintenance costs are practically nil. The Oxwelded joint will last as long as the pipe itself. Costly special fittings are eliminated: fittings can be fabricated with cutting and welding blowpipes right on the job. Lighter pipe may often be used. Pipe may be purchased in longer lengths. Additions and changes may be made at lower cost.

"A properly made oxy-acetylene welded joint is as strong as the base metal, fully 100% efficient . . . ."

The Best of Everything for Oxwelding and Cutting

LINDE OXYGEN
The Linde Air Products Company

UNION CARBIDE
Union Carbide Sales Company

Prest-O-Lite
Dissolved Acetylene
The Prest-O-Lite Company, Inc.

Oxweld
Apparatus and Supplies
Oxweld Acetylene Company

Units of
UNION CARBIDE AND CARBON CORPORATION

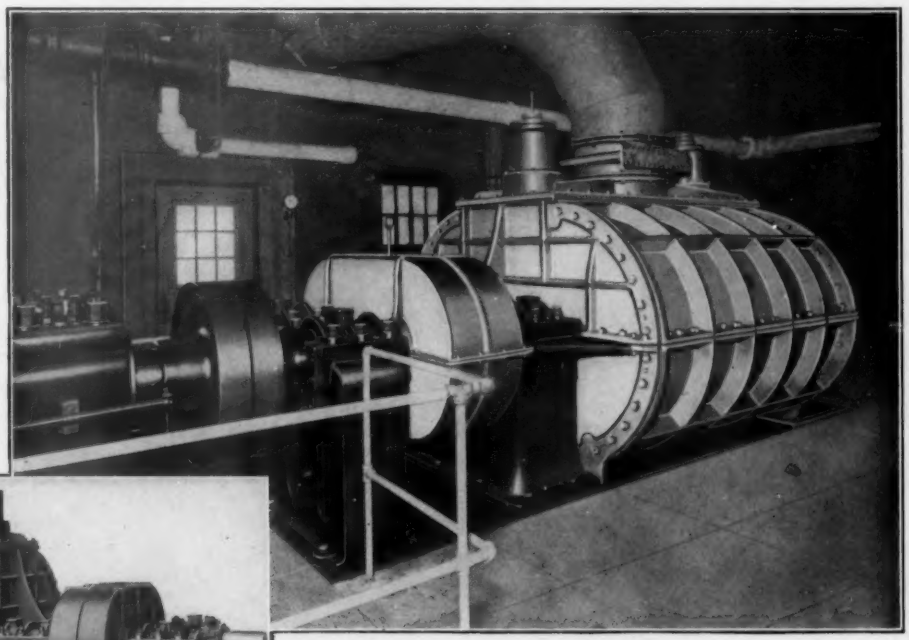
General Offices
30 East 42nd Street, New York, N. Y.

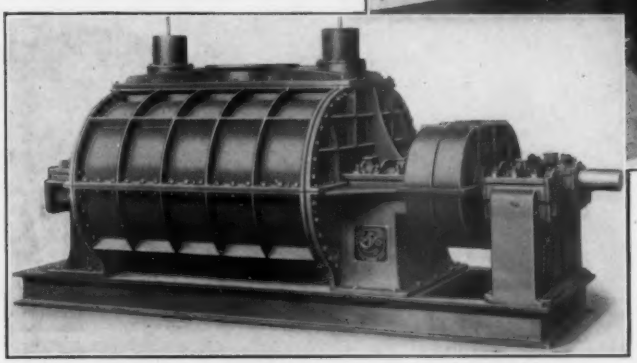
UCC

Sales Offices
In principal cities of the country

64 Oxygen Plants—45 Acetylene Plants—154 Oxygen Warehouses—138 Apparatus Warehouses—235 Carbide Warehouses

Modern Connersville Blowers
Improve Water Gas Set Operation





— at —
Rockaway Beach

Economy of power — safer operation at moderate speeds — quieter running — a positive supply of air at a higher average pressure — are the values of Connersville Blowers that improve the operation of water gas sets.

In 1923 the Queensborough Gas and Electric Company installed the Connersville Blower to deliver 26,000 cu. ft. of air per minute at 50" pressure. In 1927 another unit of the same size was added for increased volume.

Then, too, from Rochester, Richmond, Omaha, South Bend, have come interesting figures showing lower operating costs, increased make, more dependable service due to the use of Connersville Rotary Positive Blowers.

Bulletin No. 150 contains some data that will interest all water gas set operators. A request will bring a copy to you.

THE CONNERSVILLE BLOWER COMPANY
12th St. and Columbia Ave.
Connersville, Indiana

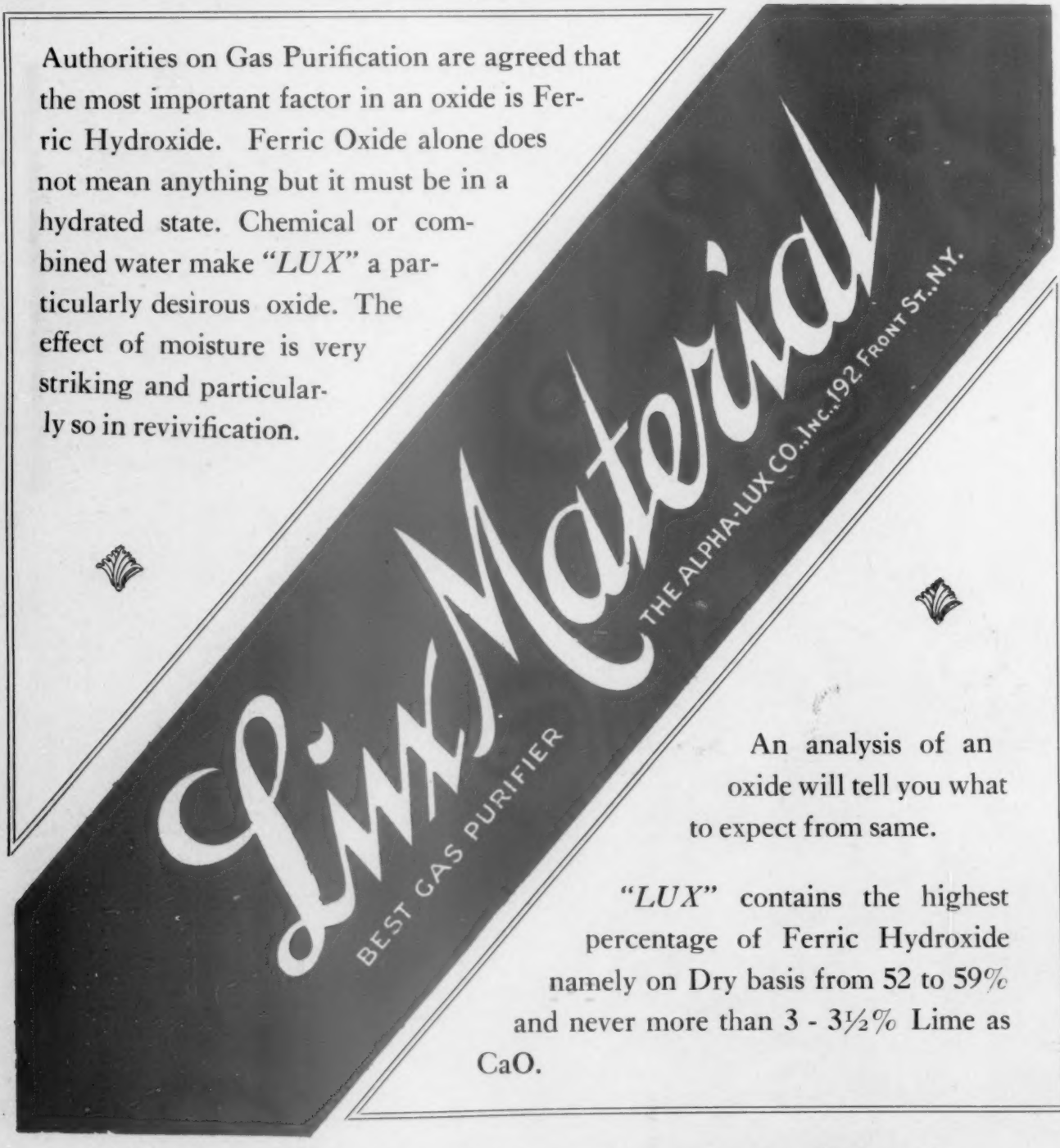
New York
114 Liberty St.

Pittsburgh
Chamber of Commerce Bldg.

Chicago
53 W. Jackson Blvd.

CONNERSVILLE
Blowers · Gas Pumps · Meters · Cycloidal Pumps

Authorities on Gas Purification are agreed that the most important factor in an oxide is Ferric Hydroxide. Ferric Oxide alone does not mean anything but it must be in a hydrated state. Chemical or combined water make *"LUX"* a particularly desirous oxide. The effect of moisture is very striking and particularly so in revivification.



An analysis of an oxide will tell you what to expect from same.

"LUX" contains the highest percentage of Ferric Hydroxide namely on Dry basis from 52 to 59% and never more than 3 - 3½% Lime as CaO.

"LUXIT H. T." Cement (Dry)

For Patching Hot Retorts, Refractory Linings, etc. Shipped in 110 lb. bags.

Order Sample Shipment Today!

COMPANY MEMBER OF AMERICAN GAS ASSOCIATION

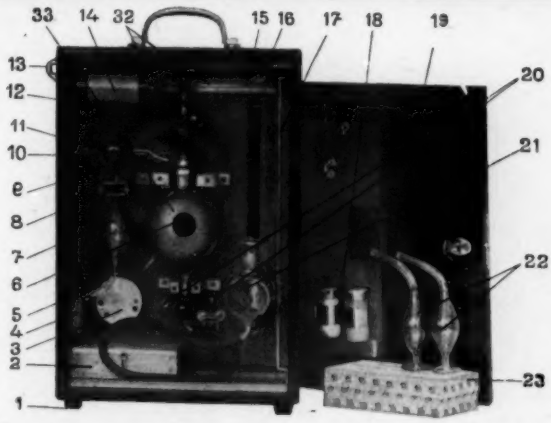
THE ALPHA—

192 FRONT STREET

HAND CALORIMETER

Dr. Strache-Kling (Loeffler Model)

For Determining the Heating Value of Gases



1. It is portable (weight under 10 lbs.)
2. It is accurate.
3. It requires only small quantities of gas for each determination.
4. It requires no water connection.
5. A determination can be made in one minute.
6. It can be operated by anybody without special training.
7. It does not require standardizing by H_2+O gas.
8. Its cost is reasonable.

The principle involved is the burning of an air gas mixture, of a known quantity of gas with a definite volume of air, in an explosion pipette insulated by means of a Dewar Vacuum jacket.

The temperature rise is recorded on an inserted thermometer. Each instrument is equipped with a computer table.

DR. OTT-LUX-GAS TESTER

For Indicating Change in Gravity of Gas, also in Heating Value of Gas

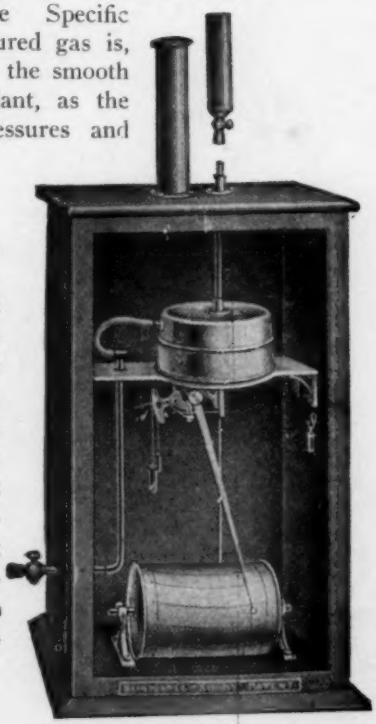
Dr. Ott - Lux - Gas - Tester is most simple in construction and operation. It combines in one operation the information usually obtained by three distinct time absorbing manipulations, namely, the **Gas Analysis, Specific Gravity determination** and **Calorimeter test.** While it is true that it cannot replace any of the three tests, where specific results are required it is equally true that it will show any changes in the gas, which are caused by **changes in composition, gravity** or **heating value.**

LUX-RECORDING GAUGE

For Specific Gravity of Gas

(Simmance and Abady System)

To determine the Specific Gravity of manufactured gas is, today, as essential to the smooth running of a gas plant, as the determination of pressures and heating values.



In the Simmance Abady System-Lux-Recording Specific Gravity balance, we have an instrument which will give us, at a glance, not only any changes that may have occurred at any time, but furnishes a permanent record of the Specific Gravity of the gas throughout the 24 hours of the day.

LUX COMPANY INC.

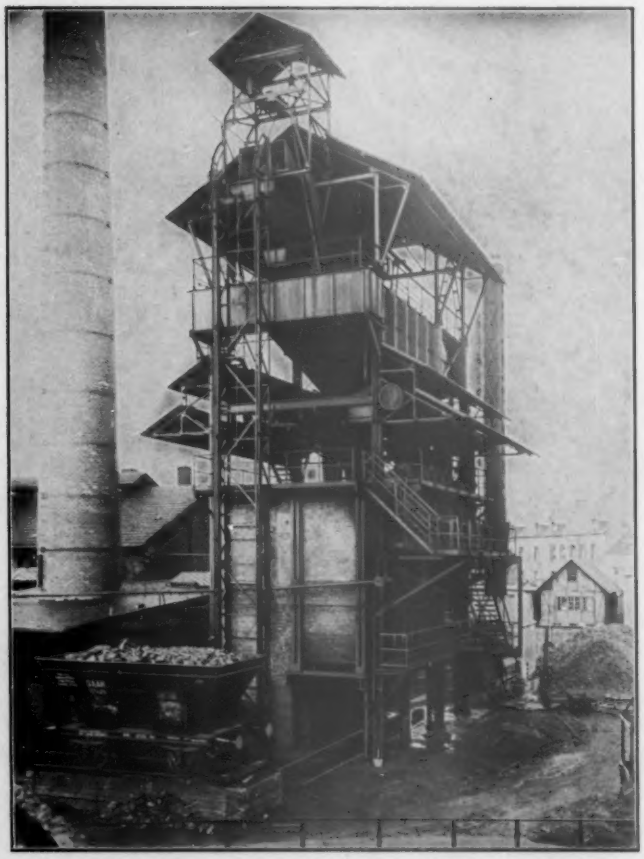
NEW YORK CITY, N. Y.

"INDUGAS"

VERTICAL CHAMBER OVEN

With Water-sealed Drop Door

INTERMITTENT TYPE



Minimum Labor
Low First Cost

The annual operating reports of the Association of Swiss Gas Plants disclose that the "INDUGAS" ovens produce the largest yields of gas per ton of coal.

The following table shows the actual average yields from coal containing less volatile matter than the average American coal:

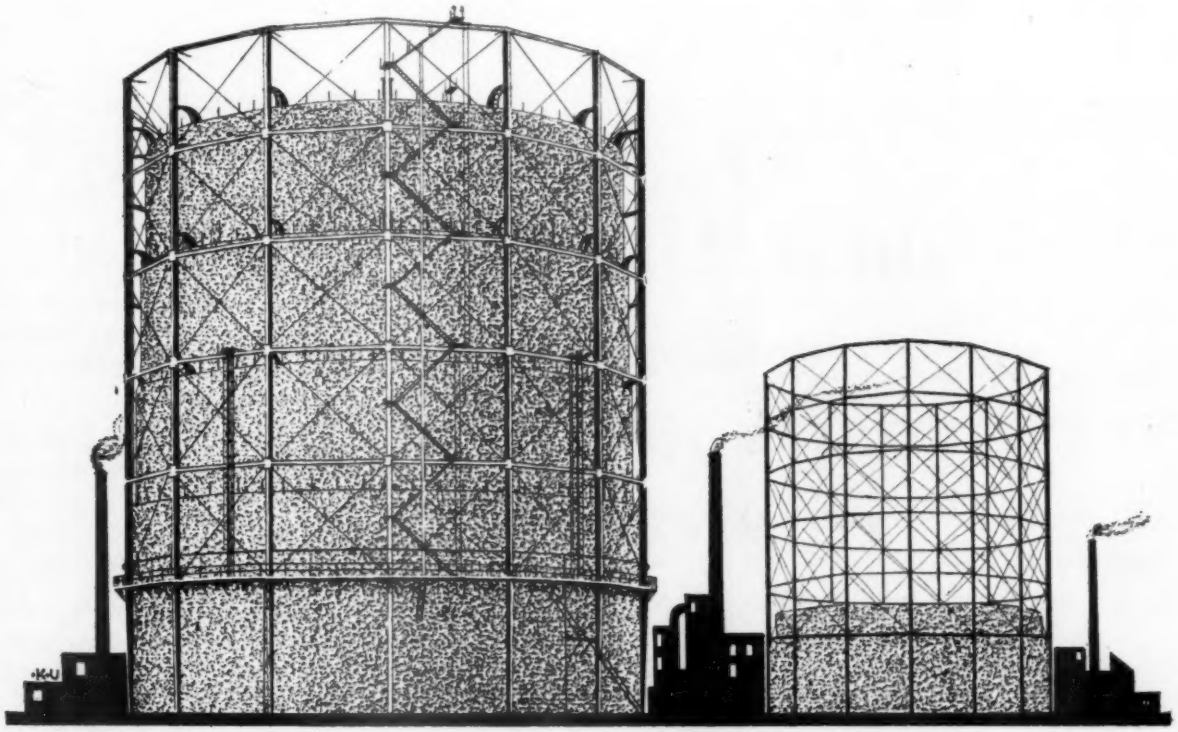
City	Time	Yield cu. ft. per net ton	Heating value B.t.u. (gross)
Baden, Switzerland	4 years average	14075	560
Olten, Switzerland	2 " "	13317	570
Friedrichshafen, Germany	4 " "	16045	515

There's a Reason

Full information, layouts and estimates gladly furnished

INDUGAS COMPANY, Inc.

114 LIBERTY STREET, NEW YORK



With Gas Holders ...

Length of Service Determines the Cost!

Cruse-Kemper Gas Holders are designed and built for low maintenance and operating expense over a period of years.

Care in designing equipment to fit specific purposes and in assembling all parts is reflected when the yearly costs are totaled.

And withal the first cost of a Cruse-Kemper Holder is only a trifle larger.

CRUSE-KEMPER CO.

Ambler, Pa.

Design that Fits the Purpose

Highest Grade Materials

26 Years of Experience

One of these 2 cements will meet your requirements

Your particular service requirements can be adequately met by one of 2 G. R. High Temperature Cements.

GREFCO, a chrome base cement, is suitable for severe furnace conditions and high temperatures, particularly where the slagging action is severe.

STANDARD Silica Bonding Cement, another General Refractories product, is suitable for bonding fire clay and silica brick, patching and general repair work. It is ideal for applications where the temperatures are lower and the service is not so severe.

Samples, descriptive data and recommendations for your individual requirements will be gladly sent on request.

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106 South 16th St., Philadelphia, Pa.

District Offices:
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Cleveland New York San Francisco
Seattle, Wash. Montreal, Canada
Havana (Representative—Woodward & McMillan)

3844

More and More Gas Engineers

Realize Reynolds Service Regulator Advantages

To the best advantage—each in their own respective fields, Reynolds Three Service Regulators (Models O, 10 and 20), meet and solve every condition and requirement in the field.

Model O, the old standard, has successfully served for a quarter of a century—Model 10 features all working parts accessible and interchangeable while in pipe line—Model 20, working parts are so accurate as to permit complete interchangeability in shops.

Complete Data on Request

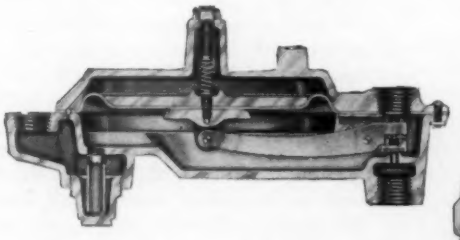
Reynolds Products

for all kinds of Pressure Reductions—for either artificial or natural gas.

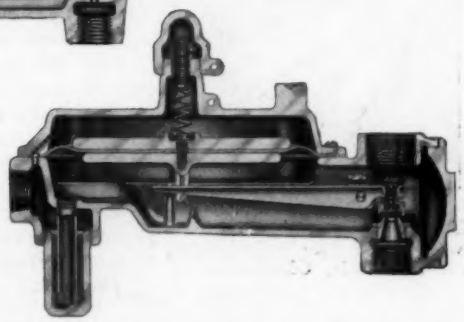
Governors—
- Intermediate Pressure
- Triple Outlet
- Holder
- Toggle Type Street

Regulators—
- High Pressure Service
- Low Pressure Service
- Intermediate Pressure
- High Pressure Line
- Single and Double District Station

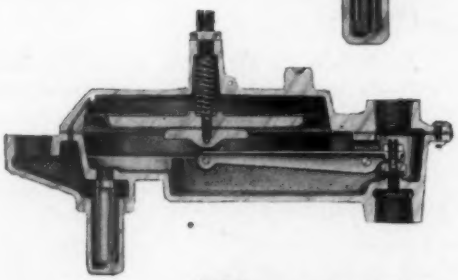
Valve—
- Automatic Quick-Closing Anti-Vacuum



MODEL O
Spring Type Only
With or Without Mercury Seal



MODEL 10
Dead Weight or Spring Type
With or Without Mercury Seal



MODEL 20
Dead Weight or Spring Type
With or Without Mercury Seal

Reynolds Gas Regulator Company
Anderson, Indiana

Representatives

EASTERN SERVICE CO.
Boston, Mass.

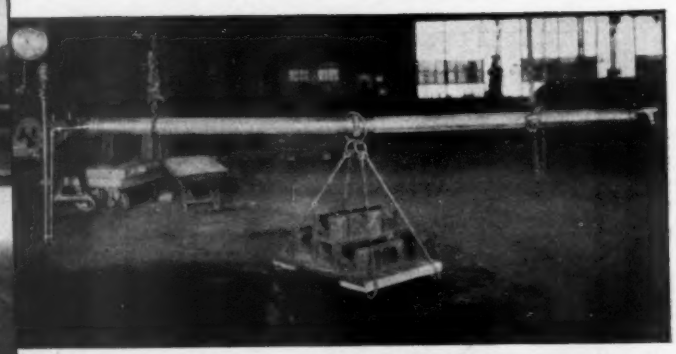
F. E. NEWBERRY
Avon, N. J.

THOS. C. CORIN
Detroit, Mich.

"FOR EVERY JOINT ON EVERY LINE"

3" gasoline line, Tonkawa, Oklahoma. Four men laid 160 lengths in 7 hours, using Victaulic Couplings

VICTAULIC COUPLINGS



Victaulic Coupling supporting 980 pound load—under a hydrostatic pressure of 1000 lbs.

Two 12" gas gathering lines with Victaulic Couplings, St. Louis, Oklahoma.

SPEED, ease and economy of installation—and leak-proof joints at any pressure from vacuum to any pressure required—have made Victaulic Couplings standard oilfield equipment for crude oil, gas and water pipe lines. Flexibility at every joint—every Victaulic Coupling an expansion joint for the pipe lengths it connects—absence of leaks when the line sags or is shifted under full load and working pressure—disconnection at any coupling without injury to coupling or pipe for cleaning the line, replacing a defective length or connecting a new line—elimination of joint-maintenance costs—these are some of the features that have earned the specification of Victaulic Couplings on oilfield and refinery lines, water, sewage, compressed air and gas lines and for a wide range of uses in process products manufacture.

Available in all sizes from ¾ inch up. For steel, wrought iron, spiral weld, and cast iron pipe—all pressures.

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CASE HARDENING SERVICE COMPANY
Cleveland, Ohio

All-purpose pipe couplings

"For every joint on the line"

FLEXIBLE LEAK-PROOF
VICTAULIC
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PIPE COUPLINGS

For detailed information, write or mail this coupon.

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FOR CRUDE OIL, GAS, WATER, SEWAGE, COMPRESSED AIR, Etc.

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New York, Syracuse,
Paragon Plaster Co.
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San Antonio Machine & Supply Co.
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Gorman L. Burnett, Inc.
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Empire Machinery & Supply Corp.
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Southern Ry. Supply Co.
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Wisconsin, Superior,
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Walter Belyea & Co., Ltd.
Ontario, Hamilton,
Thomson-Gordon, Ltd.
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Wells & Emmerson
Ontario, Toronto,
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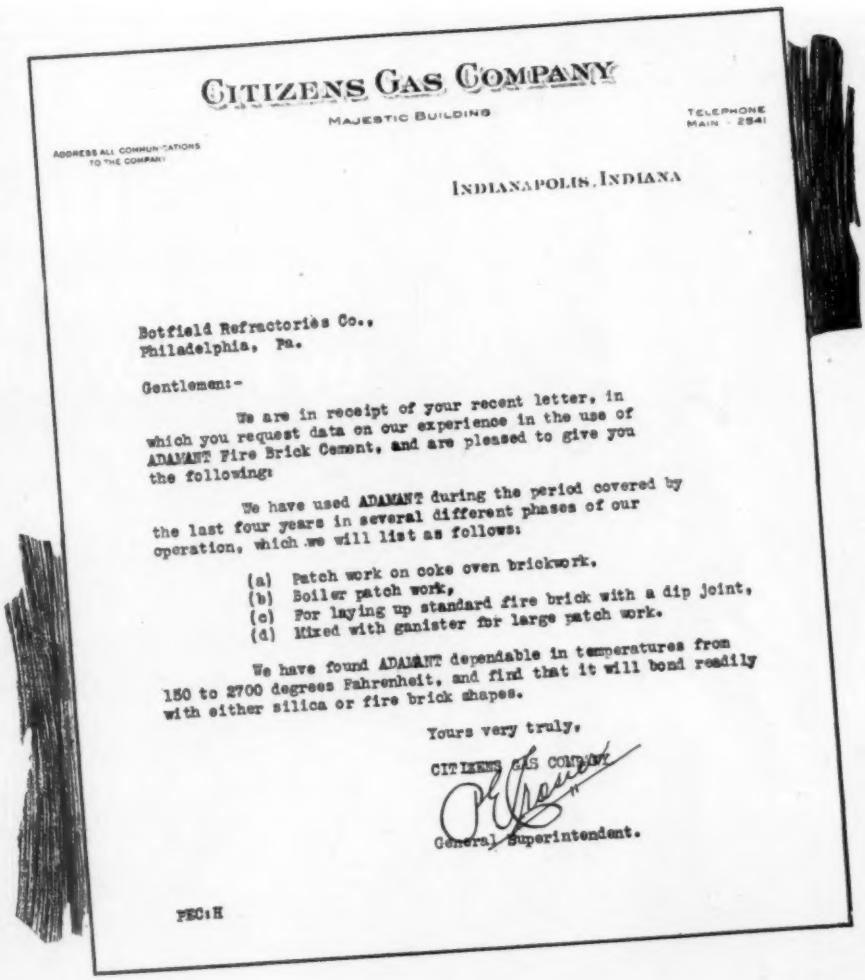
Quebec, Montreal,
Alex. Bremner, Ltd.

Foreign Distributors

France, Paris,
Compagnie Technique Des Petroles
New Zealand, Auckland,
Wilton Furnace & Coal Co., Ltd.



CITIZENS GAS COMPANY

MAJESTIC BUILDING

TELEPHONE MAIN 2941

ADDRESS ALL COMMUNICATIONS TO THE COMPANY

INDIANAPOLIS, INDIANA

Botfield Refractories Co.,
Philadelphia, Pa.

Gentlemen:-

We are in receipt of your recent letter, in which you request data on our experience in the use of ADAMANT Fire Brick Cement, and are pleased to give you the following:

We have used ADAMANT during the period covered by the last four years in several different phases of our operation, which we will list as follows:

(a) Patch work on coke oven brickwork.
(b) Boiler patch work,
(c) For laying up standard fire brick with a dip joint,
(d) Mixed with ganister for large patch work.

We have found ADAMANT dependable in temperatures from 150 to 2700 degrees Fahrenheit, and find that it will bond readily with either silica or fire brick shapes.

Yours very truly,

CITIZENS GAS COMPANY

General Superintendent.

FEC:H

Gas Plant Officials . . . . . .

interested in prolonging the service life of fire brick construction, and in reducing refractories repair work and maintenance expense, will find much of interest in the new booklet on ADAMANT Fire Brick Cement and other ADAPRODUCTS. Send for a copy of this book, and give us an outline of your refractories difficulties so that we can send you suggestions that will help you improve refractories service. Write us today.

ADAPRODUCTS

ADAMANT Fire Brick Cement

ADACHROME *Fines*

ADACHROME *Aggregate*

ADACHROME Plastic Super-Cement

ADAPATCH (Fire brick in plastic form)

The ADAMANT Gun

Botfield Refractories Company

World's Largest Exclusive Manufacturer of High Temperature Cement

Swanson and Clymer Streets, Philadelphia, Pa.

For a Long Furnace Run, Use The ADAMANT *Gun*

ADAMANT

FIRE BRICK CEMENT

Whenever You Use a Fire Brick, Use ADAMANT, *the Original High Temperature Cement*

ROOTS Blowers
WHEN:
YOU BUY YOUR CAR
BY THE WAVELENGTH
The bills for "gas" are in the terms of k. w. hrs. and "internal combustion engines are obsolete as Dodo Birds"*—some of the Roots Blowers. Pumps and Meters being installed today will still be giving full-time accurate and dependable service. Data sent upon request.
*From the recent address of a leading automobile manufacturer.
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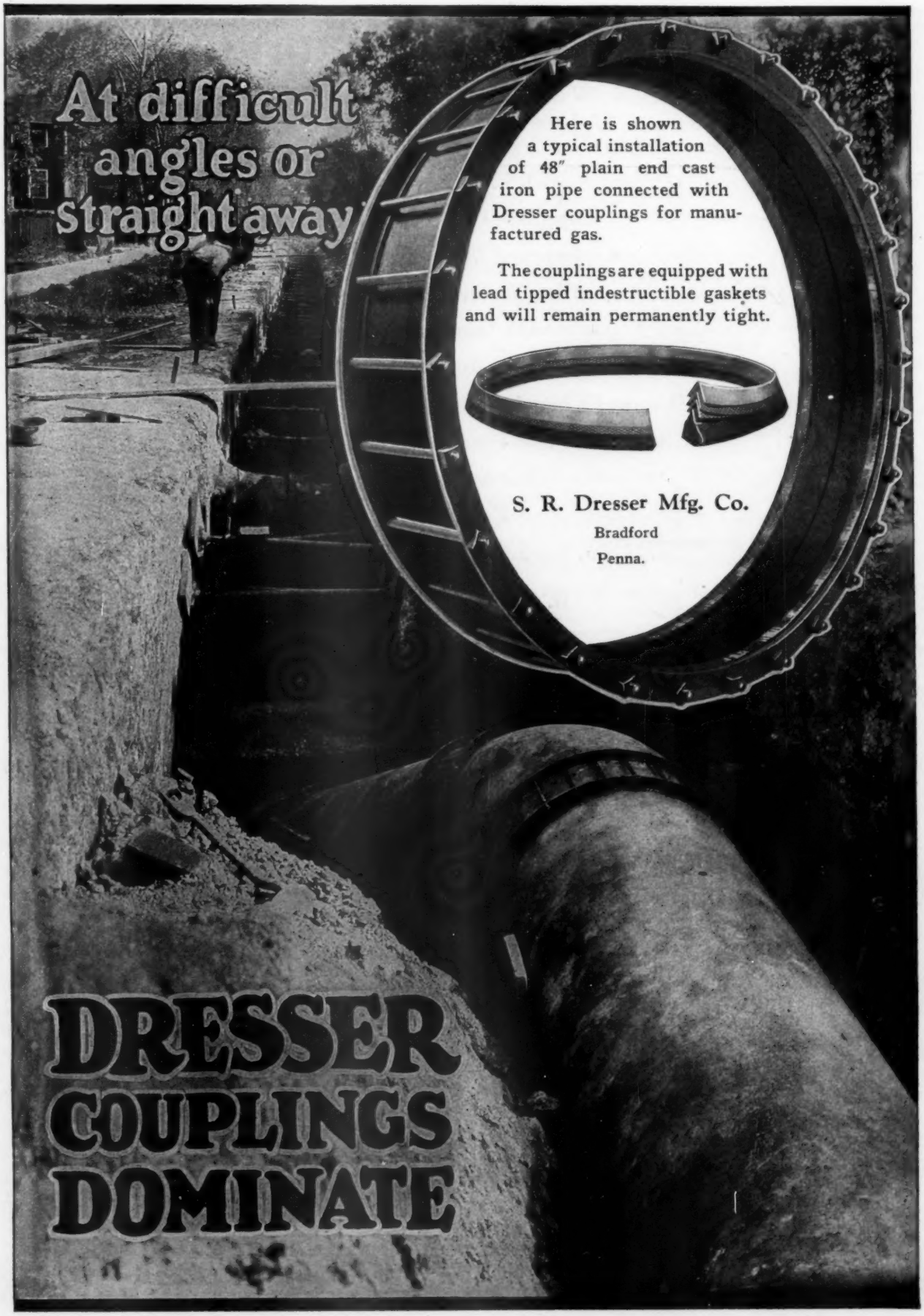
Root for
ROOTS
The P.H. & F.M. ROOTS CO.
CHICAGO
Peoples Gas Building
CONNERSVILLE, INDIANA
NEW YORK
120 Liberty Street


At difficult angles or straight away
Here is shown a typical installation of 48″ plain end cast iron pipe connected with Dresser couplings for manufactured gas.
The couplings are equipped with lead tipped indestructible gaskets and will remain permanently tight.
S. R. Dresser Mfg. Co.
Bradford
Penna.
DRESSER COUPLINGS DOMINATE

THE BARTLETT HAYWARD COMPANY

Main Office and Works
Baltimore, Md.

Pershing Square Bldg.
New York City

DESIGNERS AND BUILDERS OF

Complete Coal Gas Plants

Carburetted Water Gas Plants

Blue Water Gas Plants

Oil Gas Plants

By-Product Plants

De Brouwer Charging and Discharging Machines

Salt Water and Fresh Water Condensers

Tar Extractors

Purifiers

B. H. Co. Vertical Centrifugal Scrubbers
(Feld Type)

B. H. Co. Thickener
(Genter Type)

Steel Tanks

Vertical Waste Heat Boilers

B. H. Co. Westling Valve
(Patent Applied For)

Fast's Flexible Couplings

GAS HOLDERS

THE BARTLETT HAYWARD COMPANY'S MAIN PLANT

AMERICAN
GAS JOURNAL
Established 1859 Pioneer of the Gas Industry
Including GAS INDUSTRY Est. 1900.

HENRY M. RILEY, *Editor*

Ad Infinitum

MANY OF THE ILLS with which man has to contend emanate from the stomach. Consequently, this organ demands food that has been intelligently selected from a dietetic standpoint, properly cooked and, what is equally important, preserved in a fresh and wholesome condition from the time it is culled from the farm or packing house until it arrives on the dining table.

One of the greatest factors insuring proper food preservation is the use of refrigeration, either by ice or mechanical means and, although one might be of the opinion that nearly every family must possess some sort of means for keeping food fresh by this means, such is not the case. Indeed, many people and agencies who possess refrigeration facilities at times let down the bars with the attendant ill effects. Hence, an intensive educational movement to take care of the non-users and to keep the users in line is obviously much needed.

The National Food Preservation Program which is being conducted during the current month supplies this much-needed educational stimulus and it can be predicted with all assurance that the movement will be a success from every standpoint.

Bringing the matter closer home, every gas man who is truly interested in furthering his Industry will amply appreciate the big part the gas refrigerator will play in the National Food Preservation Program.

But, to contribute to the movement in a satisfactory way we will have to get out and hustle. We will have to boost and talk up gas refrigeration, not only at every opportunity but we will have to create opportunities. This latter thought involves a condition whereby we will have to make the public "gas refrigerator conscious"; not a difficult task if we will but realize that it can be done. The gas refrigerator is beyond doubt a proven device. It is now silently doing a great work in thousands of homes. It is economical to operate; it is as attractive a refrigerating medium as those motivated by other forms of energy; lastly, it carries an intriguing sales appeal which no other mechanical refrigerator possesses. All that is needed is for the Industry as a whole to have faith in the appliance and the salesmen and publicity men can be counted upon to do the rest.

However, we must not stop with the month of September. The active furtherance and sale of gas refrigeration should be an all-time proposition. Nothing less will suffice.

Forecasting Peak Loads

THE THREAT of sudden increases in gas demand now hangs over the head of every gas-company management. The first "cold snap" of the fall is going to bring into action hundreds or thousands, of small auxiliary heating units which have been rusting away in idleness for several months past.

There is no means for preventing this epidemic of sudden demand each fall. But there are many means by which the incidence of the demand may be anticipated and its unfortunate effects eliminated, or at least minimized. One of these means requires merely a reasonable amount of adavnce planning, the assignment of particular loads to each works or of particular extra jobs to each man in the organization who will be affected by the fall increase. It is a very good plan to do this scheming and organizing while the days are still hot enough to wilt a collar.

And it is also important for the management to watch weather reports from day to day as fall approaches. It is not possible to forecast with great accuracy just when unwanted sudden changes in load are to come, but certainly a forecast of an abrupt drop in temperature anticipated by the weather report should be a caution signal to the production manager. He should be very sure that on the morning when the chilly day arrives his holders are full to the top and everything is set to take care of the extra space-heating burden. It may be that both the weather man and the public will disappoint him occasionally, and he may have to slack off on production later in the day in order not to blow the seals of his holder. But those little inconveniences of operation are far less serious than the others which might follow in the train of unduly lowered pressure because of excessive loads without adequate gas to meet them.

Gas Man Cooperation in Systematic Fire Surveys

MANY MUNICIPAL fire departments make regular fire-prevention inspections. If this is not the practice in your city it ought to be. If it is the practice, then the gas company should have a part in it. Every fire prevented is vastly more important than a dozen fires extinguished after they have done much damage. This is a well recognized fact. It is a fact that can be sold to city officials, business men, and, we hope, even to gas-company executives. Inspections to this end should be general, not by interested superintendents, but by trained fire-prevention inspectors, perhaps best by specially trained members of the city's fire-fighting force.

The direct advantage of cooperation between gas companies and city firemen in this work is, of course, a reduction of fire losses; but the indirect advantage may be even greater in developing an understanding of gas appliances and the proper way to treat fires where gas is or may become a contributing factor in the damage done.

Gas seldom is a direct cause of fire, and then only where carelessly or ignorantly used. It may, however, through no fault of anyone, become a contributing factor, if a fire already started from other causes occasions an opening of gas lines. It is desirable, therefore, that all the fire-fighting force of the community understand just how gas installations are made, to prevent escaping gas with its attendant hazards of increased fire, and even greater hazard of possible explosion. Every trained fireman of a community should know how to turn off the gas in all varieties of service cocks which are in use. They should be encouraged to find out where such turn-off devices are located in advance of the emergency when they may need to use them. They should be assisted in every way through the active cooperation of emergency and executive officers in times when no emergency exists quite as much as during the time when a fire is being fought.

The Chamber of Commerce of the United States is holding annually contests between communities to determine which in each class can accomplish the greatest reduction in fire loss. This is adding a new incentive to local efforts. Public-utility executives should take full advantage of this trend and become partners with the city firemen in prevention as well as fire-control measures.

Helping the Salesman

ELSEWHERE IN THIS issue will be found the first article of a series, "Gas Utilization Technology for the Domestic Salesman," which should be of considerable assistance in furthering gas sales.

Months ago this matter was carefully thought out and planned by American Gas Journal staff in conjunction with the author, Mr. A. M. Apmann. In addition, other gas men were consulted as to the nature of the articles, so that the domestic salesman would be assured of obtaining a maximum of benefit from them.

The "hand-shaking" era in selling is past. Salesmen must now know their wares in order to produce. Further, they must know something of the competitor's goods. In our Industry, in order for the salesman to be adequately posted, it is necessary for him to have a practical working knowledge of the technology of appliances and the fuel that they utilize.

Fortunately, such technology can be imparted in an understandable manner and the author of the series, Mr. Apmann, has admirably accomplished this end. Alert salesmen will welcome this series and profit by their reading.

Carl Auer von Welsbach

THE DEATH of Carl Auer von Welsbach not only deprives the Gas Industry of one of its outstanding geniuses but will also cause many of us to hark back to the time when the lighting fixture bearing his name was the mightiest bulwark in our entire business. Later this selfsame bulwark was to serve us faithfully during the trying period of transition when we came to find that our big field lay in the use of gas as a strictly heating agency.

It raises an interesting speculation as to what would have happened to the Gas Industry had it not been for the Welsbach mantle. Some might contend rather convincingly that gas would have speedily become passe while others would hold that yeoman service would have been required to carry on. Somewhere between these two extremes perhaps, lies the fact of the matter.

Welcome is the man who brings ideas to the salesmanager

Carl Auer von Welsbach in inventing the gas mantle that bears his name accomplished several things of inestimable value to the Gas Industry. First, the invention itself was an outstanding scientific achievement; one to rank with Lowe's process for making water gas as a truly great chemical engineering advance in the industry. Next, it made the gas man Bunsen Burner conscious, so to speak. In this regard it would be difficult to enumerate the effects this scientist's discovery had on the later developments of burners of a varied sort. Lastly, the mantle invention threw its vast potential possibilities into the breach of gas commercial matters at a time when most needed and heartened the industry until it could find its ultimate field in the realm of heating. *American Gas Journal* feels that the latter was the greatest accomplishment of Carl Auer's inventive genius.

Although gas lighting, in this country at least, is but a shadow of its former greatness, Carl Auer has written his name imperishably in the scientific annals of the Gas Industry.

It is to be hoped that in the near future someone from the ranks of the American Gas Industry will annually offer a Carl Auer von Welsbach Medal for some particularly noteworthy achievement in furthering the use of gas.

How About Paterfamilias?

AT ALMOST every turn the average American household encounters some new device of a mechanical or semi-mechanical nature for making the tasks in the home lighter. These appliances are for the most part purchased by the woman doubtless for the plain reason that nearly all of the advertising incident to them is directed toward her. Further, it is the woman who is most often approached as a prospect by the salesman or demonstrator.

But, once let the appliance finds its way into the home and subsequently develop a mechanical ailment and forthwith the paterfamilias is pressed into service with his meagre kit of "five-and-ten" tools. He might also come in for a season of fault-finding for not having investigated the device before it was purchased. As a matter of fact, all he knows of the appliance when the S. O. S. is sent out is that there is such a "critter" in the house for which he is paying on a monthly basis.

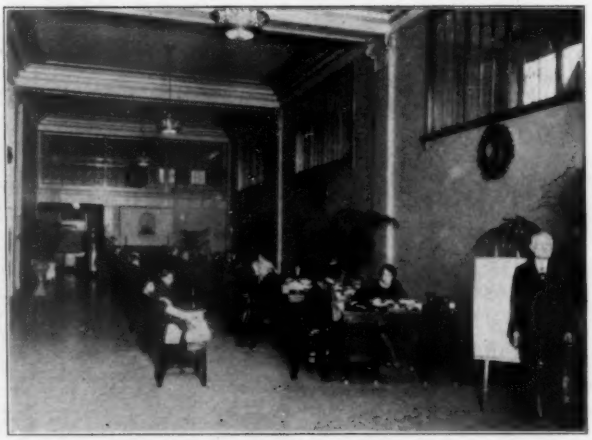
Regardless of all the appliance advertising that is written in the housewife's language and aside from the fact that she receives most of the salesman's attention it is the man of the house who is the better posted in a mechanical sense. It would seem then, that the advertiser and salesman alike should devote a generous portion of their efforts to him. Or, at least both the man and woman of the house should be sold a particular appliance—the former from a mechanical and the latter a convenience standpoint.

Say It With Capitals

THOSE IN ATTENDANCE at the coming Atlantic City Convention can be assured of the best program of papers ever presented at a meeting of gas men. Moreover, careful program planning has permitted of time to visit the exhibits.

AMERICAN GAS ASSOCIATION HAS DONE A GOOD JOB.

Greeting the Customer in a Congenial Atmosphere



Upper left—New Customers comfortably seated at individual desks while applying for service.

Upper right—Attractive Customers Service Department of Westchester Lighting Company.

Center—Cover of a booklet telling the customer how to obtain the best results from his gas service.

Lower left—Close-up of individual desk contact. The transaction is private, friendly and personal.

Lower right—Application desks set in an atmosphere of charm and comfort.

The New Customer

By H. T. East
Assistant to Vice-President,
Public Service Company of Northern Illinois.

MR. NEW CUSTOMER enters the gas company office. It is a new experience with him. He is skeptical, hesitant, half afraid. Will he get gas? How long will it take? What will it cost him? He wishes the business were over with as he approaches the clerk at the counter. Bear in mind, he comes to request service that should have been solicited of him. No salesman has ever called to sell him the advantages of gas. They have been too busy selling appliances which pay them larger commissions.

Here is a great opportunity for the company. Will its agent, the employe, make the most of it? If the applicant is given prompt, courteous, sympathetic, patient attention, with a genuine display of interest, and if an honest effort is made to explain the steps necessary to get gas introduced into his premises, Mr. New Customer will soon become reassured, flattered at the kindly attention, and leave confident that he is beginning to do business with a friendly firm. The first impression will be a good one. Mr. New Customer will be convinced that the gas company means well by him and this feeling will often be strong enough to offset some possible delay, annoyance, or shortcoming of the future.

Where Good-will Is Born

If, on the other hand, he is shunted about to several people and has to explain over and over what it is he wants; if he is met with that first cousin of discourtesy, lack of genuine interest and attention, the opposite feeling is engendered and the seed of dissatisfaction that sprouts and grows so vigorously is sown. Bear in mind at this point that the attitude which demands future goodwill effort by the company is born. This first contact is immensely important. But only the first step has been taken. Let us follow this customer for a while after assuming the company is poorly organized and managed, that it is unmindful if its obligation to the customer, and further, that it is selling gas and not genuine gas service.

Questions follow: "Do the mains pass your house? Which side of the street is it on? There may be changes. Where did you last use gas? It may be some time before you get connected. We cannot make a definite promise." Bewildering questions, demands, but no carefully presented information or helpful advice.

An application blank with the ominous title "Domestic Gas Service Contract" with many lines of finely printed stipulations interspersed with weighty legal terms is placed before him. "Sign here." Sign? He did not come to borrow money or enter into a contract. He came in to tell the gas company that he wanted to become a gas user and pay the company for it. He may be reluctant to sign papers; he has always been told to carefully read anything before signing. It would take too long to read it all and he would not understand it anyway. Finally, to avoid appearing "dumb", his signature is affixed, but not without misgivings. Anyway the thing is done. Bewildered and doubting, Mr. New Customer passes out to await developments.

The Machinery Starts

Now the ponderous wheels of the company routine begin to turn. All is as it should be; for has not this same procedure been followed by this company for over thirty years? The order is passed on to the credit department where the watch dogs of the company treasury ponder over the signature to determine by the shape of the very letters whether Mr. New Customer will pay his future gas bills. "Never used gas before", the records say. Aha! Here is a suspicious character. The company must be protected. Form letter No. X is mailed him. It is very politely worded but requests a bill guarantee deposit of five dollars. It does not explain why. What is Mr. New Customer to think? But never mind, the machinery does not stop. There is time enough to stop it later if the five spot does not show up.

The order goes, let us say, to the inspection department and is taken out the next morning by a field man. He approaches the house and with the calm assurance of one who has the proven right, critically examines the yard and house, measuring here and there, never taking the time for a friendly chat with the awed housewife about gas and how it is distributed. At any rate he has the measurements. The data reaches the office showing that forty feet of service pipe are required inside the property line and that the pavement must be broken. This sort of thing is understood perfectly—by the company men who handle it. The charges total $34.50. A job order contract is promptly mailed. "Sign both copies and return with your check in amount $34.50. Very cordially yours, Gas Company." Maybe Mr. New Customer does not have that much money laying idle just now, but he more likely hesitates because he does not understand. How could he? Nobody has ever explained that customers own the service pipe laid inside their lot lines or that the municipality requires advance payment for broken pavements. What to do? Friend wife is determined to either have gas, a new oil stove, or a divorce. He signs and sends with check attached. It won't be long now, everything is fixed.

The job is scheduled. Comes a crew to install the service. They move in on Mrs. New Customer's lawn and viciously attack it. Did the foreman tell her that it was too bad to disturb such nice grass but it would be carefully replaced? Not much, he had an order which gave him the right to dig away. The pipe is laid but there is no house piping to connect it with. "Sure you must have that done by your own plumber. The company does not do that? Didn't anybody tell you that? They thought the company took care of everything but will have house piping installed tomorrow. The ticket is marked "Not Ready" and filed away.

Mr. New Customer has piping installed and waits a day or so and then calls at the office to learn why he has no gas. A "service connection delay complaint," it's labeled. Now things begin to hum. The street department is called. "Report on Mr. New Customer, four six one Vine Street." "That service is in, completed last Friday." Now, that much misused and overworked word "Service" gets busy. To the street department "Service" is service pipe, to the complaint clerk it is the whole gas connection, and to the anxious customer it is water heated or meals cooked. Despite argument it is discovered that everything is not complete, the order is resting in a pending file. No follow up here to insure selling gas as soon as possible. "We will take care of it at once."

The meter arrives but that stove which was bought at a department store is not connected. "Can't you connect it?" "No m'am, I am a meter setter. You will have to have the company send out a fitter. Notify us when it is connected so we can set the meter." No gas sold yet at this address.

Eventually, despite everything done seemingly to delay it, the service is turned on and an unrestricted supply, of gas, the perfect fuel, is made available to perform the many functions requiring heat. If the poor customer is not thoroughly disgusted it is because the convenience of the new fuel has completely overshadowed the feeling, engendered by the mishandling of his order.

And So It Goes!

Just as sure as death and taxes a bill arrives. Strange symbols and figures, hopelessly arranged, but with the sum to pay easily enough discernible. Why is it that much? How does the company know? How can a meter measure gas? But, if he complains or inquires some clever, fast talking young fellow will try to convince him that the bill is really low and make him ashamed. Anyway they will turn off the gas if he does not pay. And so it goes.

Space will not permit a recital that includes more of the misadventures of the new gas customer. It is not intended to have this poor customer undergo all the trials and tribulations his kind is subjected to at one time or another by some gas company. Probably no company is as bad as the above, but the point is that almost every company has some practice, policy, rule or regulation that could be discarded or changed to simplify the process of securing gas service. This clinging to archaic rules and procedures is possibly more prevalent with us gas people than with our younger electric cousins. Such cases do exist and usually, because their ill effect upon customer relationship is not realized by those empowered to correct them or possibly because of the groundless belief that a change will have some harmful result. Well enough should never be left alone in this progressive age, especially where improvement will build customer goodwill, so let us examine some of the possibilities to see whether things are as they should be.

Customer Contact Quarters

Pleasant surroundings and a friendly atmosphere should greet Mr. New Customer when he enters the gas company office if that valuable first impression is to be a good one. Many companies, recognizing this fact, have provided customers' halls and offices arranged for the convenience of their patrons. The furniture and fittings need not be costly or elaborate but should have charm and should be easily accessible. Seats must be provided for use when for any unavoidable reason a wait is necessary.

It is human nature to be reasonable when comfortable. This human trait can be capitalized by providing seats for use while transacting their business. Many companies have removed counters formerly used for customer contact and replaced them with individual desks where the customer is seated with the company representative. There is a decided trend in this direction. The portographs show excellent examples of customers' halls which provide facilities insuring comfort and privacy for visitors. The arrangement has much to recommend it from a customer relations point of view.

For many years gas companies believed that it was absolutely necessary to obtain a signed application or contract from each new customer. Many organizations still insist that this is essential and picture the terrible consequence which will result if the customer's signature does not repose in the files.

The actual experience of many representative companies proves that customers do not generally like to be required to sign a contract when they merely wish to buy gas service. Other business houses do not require signatures of their patrons. Some people are skeptical about contracts, particularly those that carry stipulations too long to read and phrased with legal terms or language not understandable to the lay person. Signature requirements also make a personal visit to the office necessary thus inconveniencing the customer or entailing extra expense to the company if the forms are presented at the customer's home. By doing away with the signature requirement, calling the form a request instead of a contract, and using a minimum of simple understandable words, dealings with the new customer are made much more satisfactory. Companies which refuse to make these changes are doggedly clinging to an old practice which has no real justification and are overlooking a splendid opportunity to make their initial contact with their patrons more pleasing.

Credit Restrictions

The right of the gas company to safeguard itself against losses due to unpaid bills cannot be denied. Indeed, these safeguards benefit the rate payers as well as the company since any losses sustained must be borne by bills paid and excessive losses would eventually affect rates to all users. Ability to pay and credit status of applicants are matters which must be considered. Too often, however, the method or practice is placed in effect or continued in use without due consideration being given their effect on the new customer, who, after all, is, in the majority of cases, an honest person who intends to pay his obligations. He may not even realize that this buying gas service is somewhat different than the buying of some commodity

which he carries home with him since it is always used long before the bill can be computed. This being true why not see that this difference is carefully explained before requesting a deposit to guarantee payment if such is deemed necessary. Although new customers deserve this consideration, the reasons for such deposits are not always properly presented.

Service connection should never be delayed pending credit investigation. This can follow without risking appreciable losses in cases where the investigation cannot be completed at once. When no specific reason to doubt credit is obtained, it is preferable to give the applicant the benefit of the doubt and then watch the account closely until credit is established by experience. A more tolerant and sympathetic handling of credit regulations will undoubtedly bring good-will exceeding in value any losses which might result. This has been conclusively demonstrated.

Trained Contact Employes

Physical surroundings and company policies are important considerations but all these advantages are nullified if the personnel representing the utility company is not qualified to render prompt, courteous, efficient, and friendly service. This fact is becoming more and more recognized. Only those of pleasing personality, tact, diplomacy, with sympathetic understanding, a thorough knowledge of the business and the company's obligation to its patrons should be used in this work. Employes who have not clearly demonstrated their natural qualification should be transferred without delay to other duty.

To insure knowledge of the gas business, company policies and practices, the personnel should be carefully trained and this training must be more or less continuous. Many workable training plans have been evolved which bring about the desired result. The group conference plan where every day contact problems are discussed and the best phraseology or procedure for each case agreed upon has proved especially suitable for training contact employes. Any company which does not give the selection and training of employes the attention the matter deserves cannot expect satisfactory results.

Informing New Customers

Customers' lack of information concerning gas, its distribution and application is an obstacle to better customer relationship. This is naturally more pronounced with new customers. Newspaper advertising, public talks, cooking schools, and personal calls at customers' homes are plans which have been successfully employed to improve the situation. Perhaps the most effective means of placing information in the hands of applicants for service at the time when such information is most needed is by means of a pamphlet which can be handed out or sent by mail as soon as the address is known.

Care must be taken to see that this booklet contains information which the customer requires rather than that which the company wishes them to have, that is, it should be informatory and not an advertising medium. Some of the subjects usually covered are: history of gas, how it is made, instructions on operation of appliances, safety suggestions, description of meters and how to read them and hints concerning the economic use of gas.

One objection to this means of informing customers is the possibility that it may be substituted entirely for those personal explanations, which, properly handled, make real friends for the company. Inquiries and requests for information should never be answered by handing out a booklet although one should always be presented later. Booklets with information which will aid customers have an important place in a business as little understood as the gas business.

Service Connection Delays

Once the formalities of the application and credit approval are passed the order is forwarded for execution. Here lie many opportunities for delays and annoyances which a carefully arranged and properly controlled routine can avoid. Applicants should, of course, give ample notice, especially where mains or services must be laid, but if for any reason they fail to do so they can hardly be criticized or penalized for the failure. Imagine a competitive business blaming a prospective customer for not having arranged his purchase for the convenience of the firm. After obtaining all necessary information, and no more than is necessary, the steps required to introduce gas into the premises should be carefully explained. No promise should be made that cannot be faithfully fulfilled. If there is possibility of payments for paving or other condition this possibility should be mentioned and reasons furnished.

Analysis of time taken to complete installations will almost invariably show opportunities for reducing the elapsed time. Actual work may be delayed awaiting office records, work orders and the like. Failure to promptly forward progress reports between departments, slowness in scheduling work or deliberate delays due to underestimating the need for prompt connection often cause a loss in sales as well as dissatisfied customers. A review of a group of orders will usually reveal causes of delays which can be corrected. An adequate follow-up system, operated by a department not responsible for the actual work will also reduce delays. Such opportunities are many and the results immediate.

Many gas men, reading these remarks concerning the new gas customer will feel that it is an attempt to make a mountain out of a mole hill because the ratio of new customers to the total served is so small. Statistics show that in the United States gas companies each year serve for the first time well over one-half million new customers, men and women who never before enjoyed the benefits of the service. If they are warmly welcomed, duly informed, promptly connected, and efficiently served, who can say that the result will not be of great value to the gas industry.

Plan to Attend the A·G·A·Convention

View looking north over the new line of hangars at the Cleveland, Ohio, Airport. Here and elsewhere are offered opportunities for gas.

Watch The Airports

Commercial Aviation points the way to more Extensive use of Gas

By J. E. Bullard

COMMERCIAL aviation in this country is only about two years old. Over 1,000 airports are now being developed and more than a thousand more are being planned to-day for construction within the next year or two. The Lehigh Portland Cement Co. is offering $10,000 in prizes for airport designs. The best authorities insist that every community large enough to have a railroad station will also have to have an airport and that in less than five years there will be more planes landing and taking off each airport every day than there are trains stopping at the railroad station in the city served by the port. In this estimate only scheduled air transport line planes are considered. It is possible that privately owned planes will have to use other than the main airport of the community.

At the present time there is not a single fully developed air terminal developed in this country. Within another couple of years we may expect that several hundred at least will be real air terminals. Eventually all communities will have to have adequate airport facilities.

An air terminal must have a terminal building. This building must provide all the facilities of a modern railway passenger station. It must have a hotel for airports are usually located too far away from the hotels in the cities to make it convenient for passengers to stop at them. It must have repair shops for planes and it is desirable that it have repair shops for automobiles and busses so that the lines run by the airport management will have service facilities right at the port.

Near the port will grow up industrial centers composed of plane factories, manufacturers of plane parts, light relatively high price articles that lend themselves readily to transportation by air and producers of other goods that require rapid transportation. For example it is almost certain that the milk sold in large cities will have to be collected from wider areas than is now the case and in order to do this effectively airplanes will be used for the purpose.

Residential sections will grow up around airports for as the number of passengers carried and the mail, express and freight increases in volume it will be desirable for more and more families to live as close as possible to the port, so that the wage earners of those families who are employed at the port may be close to their work. Also there will be more and more commuting by air. Air commuting is already increasing in importance and some far seeing real estate concerns are developing residential developments around private landing fields.

It is obvious then that within a very short time there is going to be a growing demand for gas at airports. It would be highly desirable to have all buildings heated by gas in order to do away entirely with smoke. It requires very little smoke to obscure the landing area to such a degree that landing becomes dangerous and it

is possible that in the future laws will have to be passed prohibiting the use of smoke producing heating plants in the vicinity of any airport.

One of the first things that the city of Buffalo, N. Y., did when developing its airport was to drill two natural gas wells and the gas from these wells provides for part of the heating requirements. In most parts of the country gas wells cannot be drilled at the port and it is necessary to depend upon manufactured gas. However, it often happens that the best site for the port is a considerable distance from the gas mains and unless the gas company fully comprehends the gas market that is being developed at ports some other fuel than gas must be used.

Let us now consider the uses of gas at an airport. The first buildings usually erected at an airport are hangars. If winter flying is to be done it is desirable that they have heating facilities in order that the engines on the planes can be more readily started and it will not take so long to warm them up.

Next in importance to the hangars are the repair shops. These obviously must be heated if work is to be done in them in the winter time. They also should have facilities for the heat treating and the working of metals. Metal is playing a greater and greater part in the production of planes. Big transport planes are being made entirely of metal. Metal propellers are becoming more and more popular and a slight accident is likely to cause a propeller blade to be bent and this blade has to be straightened or a new one procured.

Prospects in Terminal

Before a successful passenger business can be conducted throughout the year a passenger terminal must be built. In addition to waiting rooms and concourse, provisions must be made in these terminals for executive offices of transport companies, quarters for pilots, restaurants and the like. In this building in addition to heating, there must be fuel for cooking, for heating water and some means provided for refrigerating the food kept in stock. Gas can be utilized for all these purposes.

It is quite probable that the airport management will find it necessary to provide transportation to the city. This means using busses and smaller cars and having a servicing and repair station for these vehicles. Here gas will be needed for the usual purposes in repair and paint shops.

As factories locate at the port they will demand the supplies of gas needed for the various industrial processes requiring heat. The residential section around a busy airport grows faster than any other residential section in or near the city and this growth will continue long after the airport has become fully developed, for around every transportation terminal of any kind there is always an increase in building. The vicinity of an airport promises to lend itself much more to residential development than does any other type of transportation terminal. The fact that it is some distance from the city itself tends to increase this growth.

The opportunities for selling gas to the airport will naturally vary with each port. Each one is a special problem in itself. However, it is important that every effort be put forth to provide an adequate supply of gas to the port just as soon as development has gone far enough to create a demand. After oil heaters and oil fired cooking apparatus have been installed it is not nearly so easy to get the business as it is when the port is just being planned.

Gas Salesman Must Be Alert

The gas salesman will do well to keep in very close touch with the airport manager. If the port has not yet reached the stage where it has a manager then business must be done with the chairman of the airport commission which is charged by the city with the duty of developing the port. If a private concern or individual is developing the port then the manager of the concern or the individual owner is naturally the person to see.

Some private companies are already planning airports that will cost from one to several millions of dollars to develop. Virtually every city of any size will have to provide a public airport. The present estimate of the Department of Commerce of the cost of a port that will meet the requirements of a public airport for a city is two dollars per capita. This cost will go up as air traffic increases, planes become larger in size and greater areas and better runways are needed at the airports.

Every gas company, therefore, may profitably have one salesman who spends enough of his time studying the local airport situation to keep fully informed in regard to the possible gas market it offers. The potential demand is certainly very large and though the present sales may not be large they are sure to increase to such a degree within a very few years that a gas company can well afford to make a considerable investment to supply the initial demand. If gas is the first fuel used in and around the port, it is likely to be the only fuel, provided an adequate supply is always available.

Plans of America's largest city for aviation facilities

Uses Gas to Speed up Aircraft Making

Commercial aviation is coming into its own. Recently the air-traveling public has demanded "ships" of graceful lines and comfortable appointments. Aircraft makers everywhere are responding with alacrity. To keep up with the pace thus set, old methods of manufacture give way to new day after day. Among these changes is that of switching to the use of gas for refined heating operations in aircraft factories.

Naturally, when city gas is not available, Pyrofax may be used with every bit as much advantage as city gas. This fact has been fully recognized by the Fokker Aircraft Corporation of America at its Teterboro, N. J., factory.

About a year ago, a single Pyrofax unit was installed to furnish gas for soldering-furnaces. Pyrofax proved its worth immediately, and in the summer two more units were added to help conduct other operations.

At the start, the use of Pyrofax was confined to the tin shop. In this department fusilage sheeting is stamped, formed and assembled. In the assembly stages soldering and tinning operations are important. One of the important products used in the wooden fusilage frame assembly is hot glue. So Pyrofax was given the job of heating the glue pots in the main assembly room. A combination heating pot and ladle with a Wolf Urn Burner is used.

Polished fittings for ship cabin interiors distinguish most of the airplanes made today. Many of these fittings must be specially constructed. Usually the unfinished fittings are plated and polished by the plane maker. Before plating, all dirt and grease are removed from the parts by placing them in a bath of cleaning solution which must be kept at a temperature of 200° F.

Originally, smaller parts were placed in baths heated by means of hot plates. Later on larger parts, such as motor shields were required to be highly polished and larger baths were installed. A vat, four feet by two feet deep, was built. Under it were placed two No. 60 BCE Johnson Industrial Burners. Although this vat was originally designed to be heated by electricity, Pyrofax Gas has been substituted because the operator maintained that gas heated the contents much more quickly. Often the baths must attain maximum heat quickly.

—Pyrofacts.

Government Producing Helium on Large Scale at New Amarillo Plant

The new Government helium plant, located at Soncy, near Amarillo, Texas, produced during July 648,850 cubic feet of helium, of an average purity of approximately 97 per cent, the United States Bureau of Mines, Department of Commerce, announced recently. The first shipment of helium from the plant was made on May 6, and production has been steadily increasing since that date.

While detailed cost data are not yet available, it is confidently believed that production costs at the new plant will be well within the previously estimated figure of $20.00 per thousand cubic feet of helium. This is the lowest figure at which helium has ever been produced, so far as is known to the Bureau of Mines. Only a single unit of the plant is now in operation. When the second unit is completed, in the near future, the normal capacity of the plant will be far in excess of present Government requirements. With practically the same fixed charges, production can then be increased to any desired amount up to 20,000,000 cubic feet, or more, per year, and costs per thousand cubic feet of helium will depend on the amount of orders received.

The average cost of helium produced at the Fort Worth plant during 1926 was about $34 per thousand. Compared with this figure, a cost of $20 per thousand effects a saving of approximately $36,000 in the helium required for a single filling of the Los Angeles, or $91,000 in the cost of the 6,500,000 cubic feet required to fill one of the big ships now under construction for the Navy.

Shipments of helium are now being regularly made from the Amarillo plant in specially designed tank cars to the Navy at Lakehurst, N. J., and to the Army at Scott Field, near St. Louis, Mo., and at Langley Field, near Newport News, Va., for use in the dirigibles operated by these services.

Before the World War, Helium, which had been obtained only in small amounts as a curiosity in scientific laboratories, cost about $2,000 per cubic foot. As the result of research by the Bureau of Mines, in cooperation with other Governmental agencies and commercial interests, production costs have been brought down to approximately 2 cents per cubic foot. No other nation is able to provide its dirigibles with this rare, noninflammable gas, it is pointed out, because supplies of helium-bearing gases in magnitude sufficient for such large scale production have so far been discovered only in this country. The German dirigible, the Graf Zeppelin, which recently completed a successful transatlantic flight, must depend on the highly inflammable hydrogen for its buoyancy.

Helium is extracted at the new plant from natural gas having an average helium content of approximately 1¾ per cent produced from the Cliffside Structure lying northwest of Amarillo. Gas from 26,000 acres of land is available to the plant.

A Priceless Natural Resource

"Natural gas is the Nation's priceless and irreplaceable natural resource and to its reasonable and effective conservation the American Gas Association is pledged," declared Alexander Forward, New York, managing director of the American Gas Association, before the recent annual meeting of the Colorado Utilities Association held in connection with the annual meeting of the Rocky Mountain Geographic division of the N. E. L. A. at Glenwood Springs, Colorado.

"Rapid growth of the use of gas in industry is shown," said Mr. Forward, "by the fact that the average increase in gas sales per customer of every class in the last ten years has been 17.4 per cent while for comparison the increase in the use of electricity per customer in every class in the same period has been 9.6 per cent or a little more than half the average increased use per customer of gas.

Specific mention was made by Mr. Forward of the growth of gas refrigeration as one of the industry's more recent developments, and the installation of 1,100 gas refrigerating machines in a single New York apartment within the past few days was pointed out.

"The average American home of a few years hence," said Mr. Forward, "will be heated and cooled by gas the year 'round."

Inspection and Maintenance of Gas Benches

By Glenn H. Niles

Chief Engineer, Improved Equipment—Russell Engineering Corporation, New York City

THE operator who would get the greatest profit from his retort benches must maintain them in the best possible condition until they are worn out. To do this, the benches must be frequently and inquisitively inspected as it is of primary importance that they be kept in steady operation. It is improvident to operate benches having retorts which will not hold gas; require more than a normal amount of fuel; which, because of draft leakage, cannot be maintained at a good oven heat.

Few retort benches actually collapse, but many of them are operated long past a period of profitable production simply because they continue to make gas. A well built, properly operated and maintained bench will eventually wear out, and it is more profitable to destroy a bench by making it perform useful work as rapidly as possible than to operate it for a longer time at less than its capacity. It is good business to carry the highest safe heats and burn off the heaviest possible charges, and the bench will last longer under these conditions if given frequent inspection and proper maintenance than if operated with fluctuating heats, uneven charges and little or no attention to upkeep.

A bench not properly dried before being put into operation and not suitably maintained may operate well for a short time and then give trouble so suddenly that there will be no question as to the advisability of getting rid of it. But because a bench that has been properly constructed, carefully dried and given the necessary attention to its maintenance does not suddenly fail and has, in fact, an almost indefinite life, it becomes a matter of considerable judgment to determine just when it ceases to be an economical unit in the gas making process. It is, of course, sometimes necessary to continue a bench in operation, while it is in bad condition, because its capacity, reduced as may be, is needed to meet the sendout but, based solely upon its efficiency for processing coal and without reference to a financial consideration, or opportunity to shut it down because of sendout conditions, a bench should be replaced when the necessary repairs are of a major character, fuel requirements more than normal, gas leakage excessive and heat control difficult. The ordinary repairs which can be made to a bench during operation and which serve to keep it in good general condition are so inexpensive, yet so vitally necessary, that failure to provide this attention may let it get into a condition beyond repair and require replacement because of the failure of some particular part rather than due to general wearing out.

Bench Maintenance and Coal-Gas Efficiencies

With coke ovens and water-gas making the largest percentage of present-day supplies, the humble retort bench has been much neglected. Nevertheless, this unit is still a vital part of the gas-making system in literally hundreds of small plants. The efficiencies of such works depend on proper inspection and maintenance of this equipment. Managers will, therefore, welcome this article by Glenn H. Niles, who heads one of the most experienced technical groups dealing with coal-gas plant building and repair work. The numerous practical suggestions in the article deserve careful study by every works management that has any horizontal retort equipment.—Editor

It is more or less common practice, when the reports fail, to make a rather cursory examination of the bench and, if the producer and recuperators do not have any glaringly apparent defects, refill above the floor line with new retorts and settings. There are cases in which this procedure is warranted, but more often than not, such a course is productive of future difficulty and before proceeding along this line, a thorough inspection and test of the recuperators should be made. These parts of a gas bench are practically inaccessible for close examination and although, during operation, the recuperators may not have appeared to have any serious defects they may, when the bench is shut down, develop open joints, cracked tiles, etc. which will cause trouble when the bench is again heated. There is no especial difficulty in relining a producer, providing new grate fittings if needed, or installing new nostril blocks, because this part of the bench is open and accessible when the retorts have been removed, but almost every operator will realize that recuperators, left under a second set of retorts and which develop leaks soon after firing the refill, are liable to more or less continual leakage thereafter.

An operator can, by making a few simple tests and a careful inspection, determine quite to the point whether the useful life of a bench has been expended. If, after drawing a charge and before putting fresh fuel in the producer, the seal on the dip pipe is increased above normal and the retort then heavily charged, the presence or absence of smoke in the combustion chamber will indicate whether or not the retort is tight. If the retort leaks, an attempt should be made to patch it, but if it is old and the bottom tiles cracked or worn, it may be difficult to make the patches remain in place. It is obvious that the operation of a retort in such condition that it cannot be closed by internal patching is unprofitable, and if this condition applies generally to all retorts in the bench, they should come out. An-

other indication of an unprofitable bench is the steadily increasing demand for fuel. This may be due to a number of causes—a very common one being leaky recuperators from which sufficient air, to burn the producer gas does not reach the secondary nostrils because of its being drawn through open joints or cracks into the waste gas passages and up the chimney. This condition can often be detected by the presence of short blue flames at the walls of the waste gas passages of the recuperator if the secondary air be shut off while making the inspection. In many cases it is very difficult to stop these leaks because the patching material must be forced into the openings against the flow of air.

Front wall of bench protected by splasher plates

An increasing demand for fuel may indicate leaks direct from the combustion chamber through the rear wall into the chimney flues, and such leaks are usually inaccessible. Burned out nostril blocks cause poor distribution of the producer gas, and leaks in the draft system make it impossible to hold back-pressure on the bench, and the operator is unable to prevent the too free burning of the fuel or to affect the complete combustion of the producer gas by regulation of the secondary air.

The producer may need relining, which can be determined visually and by an examination of the larger clinkers which have been knocked off of the side walls as they occasionally have bits of fire brick attached to them.

Liklihood of Damage by Cooling

It may be necessary to shut down a bench in order to reline the producer, but unless this operation is conducted with extreme care the cooling effect may cause so much damage to retorts and recuperators that it will not pay to put the bench back into service unless they also are replaced. In benches having inside producers the side walls or inside lining of the firebox are depended upon for a substantial part of the support of the retorts, and any weakening of these walls may allow settlement of the lower retorts and the setting tiles which span between them. When determining the extent of repairs to a producer lining, consideration should be given to the retorts and recuperators.

The initial inspection of a gas bench should be made when it is installed. The operator should give attention to the erection of the bench so that he will be familiar with the details of construction which will not be apparent after the bench is closed up. Before starting the drying fire, a further inspection should be made in order to make sure that the bench is ready to operate.

A bench, if it is not properly handled during the drying and initial heating, may be practically ruined, and the operator should make frequent inspections as the heat increases. Regardless of how carefully and steadily the moisture is driven from the brickwork there will be some inclination for the masonry to warp and shift as the temperature rises. This need not necessarily damage the structure, but attention must be given to the binding or other apparatus against which the bench abuts. The tie rods must be adjusted in order to prevent breakage and to avoid bulging the walls between the buckstays. This applies more particularly to end buckstays and longitudinal tie rods, but front and rear buckstays and cross beams will need some adjustment. If the longitudinal tie rods are too tight the crown of the arch may raise, with the result that the upper ends of the joints between the arch blocks will open and allow the top filling to sift in. Such an arch is weak and is liable to burn through. All cracks and open joints which develop in the outer walls of a new bench should be carefully raked out and pointed after the bench is up to full heat and in operation.

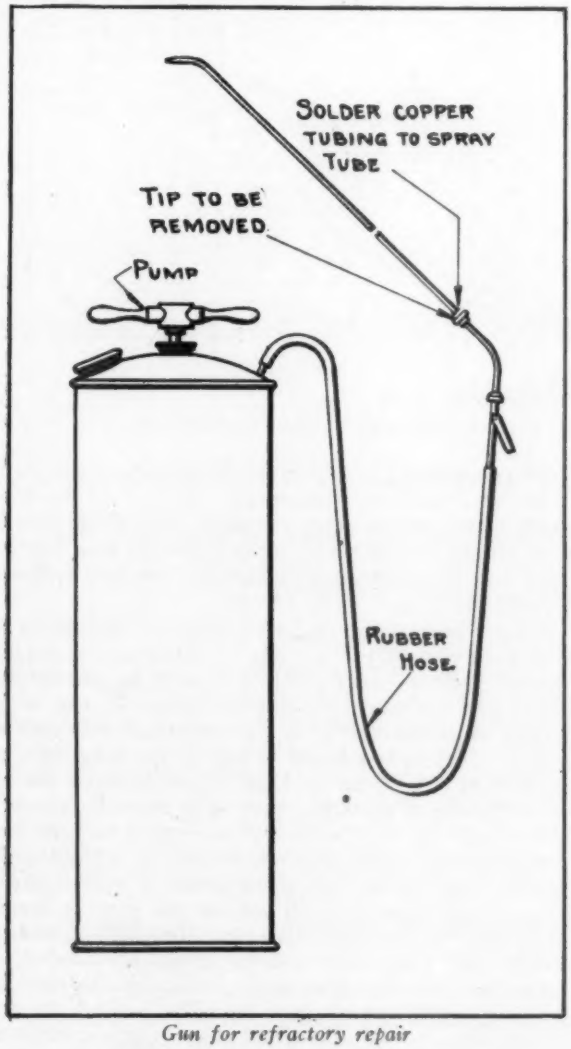
Quenched coke on charging floor. Front wall of bench is protected by splasher plates

The binding must be kept free and clear as the atmosphere in a retort house is corrosive to steel, and dirt or dust which will hold moisture against the base of buckstays or at the point where they pass through the charging floor will cause them to eat out and become weakened. Neglect to maintain bench binding in good order and reasonably tight is a very frequent cause for rebuilding pier walls and arches before they have been worn out.

Use of Splash Plates

In retort houses where it is customary to quench the coke on the charging floor in front of the benches the front walls may be preserved by the use of splash plates fitted under the bottom mouthpieces and extending down to the floor so as to keep the coke and quenching water from the brickwork. The coke chute block is often destroyed by the splash of quenching water and the coke chute frame becomes loose and allows the escape of producer gas around it. If this gas is permitted to burn the damage becomes progressive and the need of a new block and frame is only one of the results of this neglect. Bench regulation is interfered with, the front

wall becomes so hot that the stokers hesitate to go near it, and the fuel is increased. A removable steel plate laid over the coke chute door when retorts are being discharged will prevent much of this trouble, but any leaks which develop around the coke chute frame should be patched immediately with fire cement.



Gun for refractory repair

The sight hole plugs in the walls of the combustion chamber and recuperators should be kept tight. If they do not fit properly, they should be mudded, and if broken, should be replaced. Leakage in or out through these openings will interfere with the draft and heat regulation. This is one of the most common sources of trouble with benches as they grow old. The plugs are inexpensive, and their neglect is inexcusable, as well as unprofitable.

The lip of the lid and the front flange of the mouthpiece body should be scraped frequently in order to prevent the accumulation of pitch and carbon which, if allowed to remain, will eventually cause the mouthpiece to warp and leak. This point is too frequently neglected and, if not regularly attended to, will require the use of mud or clay to prevent leakage.

Effect of Leaky Joints

Leaky joints in standpipes and hydraulic main connections are immediately self-evident and although they may not affect the operation of the bench directly they will affect the apparent yield per ton of coal. Stopped standpipes are very hard to clean and the prevention of this trouble is much easier than the cure. The pipes should not be allowed to get into this condition, and they can be kept open by frequent "bulling." The augers and reamers used for this work should, however, be kept at their full diameter so that the pipes will not gradually fill up because of the wearing of the auger blades. Considerable damage is done to retorts by stopped pipes, as the gas builds up a pressure in them and its only escape is through the joints of the retorts into the combustion chamber. Much of this escaping gas will burn on the outer surface of the retort and cause local overheating and gradual enlargement of the opening through which it escapes. If scrubber standpipes are used, the valves will require occasional attention to keep them in good order. A sufficient quantity of liquor should be used in these pipes to keep the inside surface wet at all times. The connection from mouthpiece to scrubber pipe should be frequently and carefully reamed, and the auger should not be knocked against the valve mechanism. The seal pot at the lower end of the scrubber pipe requires frequent cleaning to prevent the accumulation of sediment which will not wash out through the overflow.

Inspection of Dip Regulator Necessary

The hydraulic main must be kept level in order to keep all dip pipes at an equal seal, and it should be regularly cleaned of any sediment which may accumulate. Occasional inspection of the dip regulator is necessary in order to remove the accumulation of tar and pitch on the overflow and which results in raising the level of liquor in the main and increasing the seal of the dip pipes.

The top of the bench should be kept free of the too common accumulation of dust and as the dust can not be prevented regular cleaning is necessary. If this is not done, the dust may become so deep as to cover tie rods and cross beams and cause their heating to the point of burning off.

The habit of neatness in the retort house will reduce the amount of attention that must be given to these items which concern the exterior of the bench but there are other equally important matters which affect bench operation to a great extent and which the operator must search for as they will not be self-evident every time he comes into the retort house.

Care of Recuperators

The recuperators should have regular inspection—a large amount of dust will get into them and although some of it will be carried through and up the chimney there will be a continual accumulation in the turns and flues. To be effective, recuperators must be clean, and as the walls of the flues are thin and intended for the transmission of heat any accumulation of dust on their surfaces will reduce this transfer of heat and may cause sufficient overheating to expand or warp the tiles and open up the structure.

In some types of recuperators it is difficult to reach all points with a hoe or scraper and in such cases a low pressure steam jet may be used if proper care is taken. The steam jet should not be directed continuously at any one spot or it may blow out a joint or crack the tiles. If dust is allowed to lay in the recuperator flues too long it becomes almost impossible to safely remove it because such means as will be necessary will be so violent as to be dangerous. Attention should be given

to the recuperators during the first week of bench operation and regularly thereafter. More frequent cleaning will be required if the bench fuel is coal than if coke is used, as the dust from coal mats and vitrifies more quickly and with greater hardness than the dust from coke fuel.

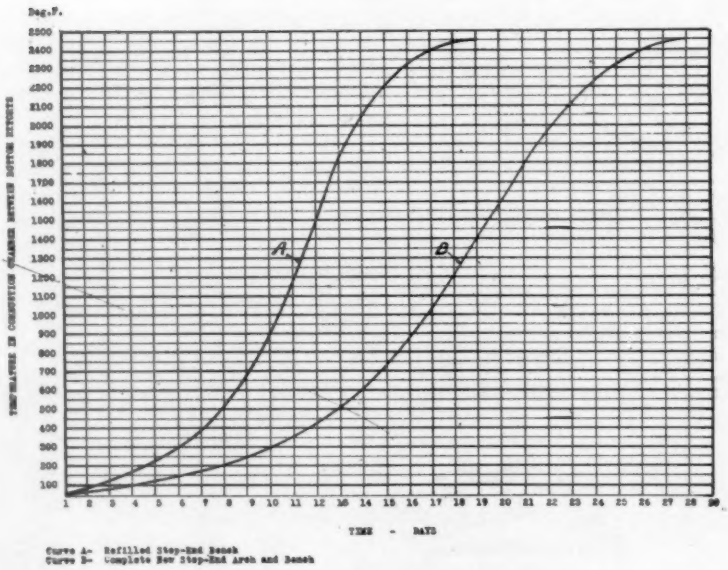
A good fire cement is better material for patching recuperators than ordinary fire clay and, if made into a thin "soup" and forced into the cracks or joints under pressure will usually make a better job than by the use of plastic cement on a paddle. A serviceable cement gun for this work can be made by the use of an ordinary garden spray can having a hand pump as shown by the accompanying sketch. If the tip of the spray nozzle is removed and about 10'0" of copper gasolene tubing put in its place, the cement "soup" can be forced into the leaks under pressure and the copper tubing can be bent to reach around corners if necessary.

The vertical waste gas flues in the rear wall of stop-end benches should be kept free of dust and soot, and the violent rattling of a chain hung down them will usually cause the dust to drop to the bottom where it can be cleaned out through the lower recuperator pass.

Retort benches are commonly provided with some form of front wall binding, and the cross bars are attached to or press against the mouthpiece flanges. As the bench comes up to heat the retorts are likely to push forward at the front wall against these bars and they should be slackened sufficiently to prevent bending. These cross bars are usually caught behind the buckstays or attached to them and if they are not properly loosened as the retort expands the buckstays are likely to be pushed forward or bend. The expansion of a silica retort, both as to extent and rapidity, varies somewhat with the time-temperature rise and after the bench has been dried out and is ready for charging the front wall binding should be again inspected to see that the cross bars are snug but not too tight.

Patching Retorts

Silica retorts, when first charged, will leak somewhat as the commercial form of silica used is a ceramic material of considerable porosity. After a few charges, however, the retort should be practically tight, as carbon will close the pores and any small joints in which the shrinkage of the mortar has left a slight opening. As the retorts are used there should be a regular inspection of them and openings which may occur should be immediately closed before they have time to become enlarged. These openings can often be detected by a short blue flame burning in the retort where producer gas leaks through. A high temperature cement may be used for patching retorts, but the openings should be thoroughly cleaned out and freed of any carbon, dust or loose pieces before the cement is applied. If the patching is not done soon after the leak occurs the opening may increase in size, the surface of the silica at the leak become soft and brittle, and the patches put on after this has occurred are likely to come off. Obviously, all patching should be done with great care, the cement forced as deeply as possible into the opening and the interior surface well smoothed. Leaks in the bottom of a retort can often be stopped by hoeing a pile of dry fire cement back and forth over the opening, as many of



Proper temperature curves for drying-out

these cements are so made that they will calcine in the joints or cracks and eventually become as hard and tough as the silica retort material. If a large hole has been broken in the retort, it is better to fit a piece of brick into the opening with cement than to use the cement alone.

Retorts must be periodically scurfed, and leaks are liable to be noticed particularly after the carbon has been removed. Some coals will carbon a retort quicker than others, and the scurfing should be done only and as frequently as is necessary, as the operation of decarbonizing a retort of too much carbon at one time does not improve its condition. In hand charged retorts the carbon accumulates most rapidly and to a greater extent at the rear end and if it is allowed to remain will cut down the weight of charge that can be put in. Incidentally, carbon at the closed end of a retort is hardest to remove, and if it gets a good hold at this point it is practically impossible to get it all out. In machine charged retorts, and which are usually thrus, the carbon accumulation is more frequently found at the charging end, and if allowed to build up will, in time, constrict the entrance to the retort and may interfere with the charging operation. Carbon should be burned loose from the retort walls to a point where it nearly falls off, as the use of a slice bar requiring any considerable force is dangerous.

Shutting Down Procedure

It is sometimes necessary to shut a bench down in order to make repairs or because its production is not needed and should this become necessary extreme care must be exercised. As the temperature is reduced the structure and the individual refractory blocks or units will contract. If the cooling effect is too rapid the strain on the blocks will cause them to crack and pull apart, and this applies particularly to silica material. The escape of heat from the bench from its operating temperature down to about 400° F. should be as gradual and slow as the original rise of temperature when the bench was put into operation. It is good practice, when a bench must be shut down (if it is intended to be put back into service), to leave the charges in the retorts and fire the producer steadily with decreasing amounts

of fuel so that when the fire is out the producer will be full of ashes and the retorts full of coke. The dampers should be gradually closed during this procedure so that there will be no rapid draft through the bench. It is practically impossible to shut down a bench without doing some damage, but this can be reduced to a minimum by very careful attention.

It has been previously stated that a bench may be practically ruined if not properly dried and heated, and the maintenance which will be required by a bench will be very largely determined by the care given to it during the first month after firing. The chart shown herewith will serve as a practical guide for refilled or complete new benches, and will indicate the progressive rise in temperature for stop-end benches. For this type of refractory masonry the time required to dry and heat it to the operating temperature is roughly at the rate of two tons of masonry per day, but it is important that the time-temperature curve be somewhat as shown on the chart and not a straight line. The rise in temperature up to 300° F. will require approximately one-third (⅓) of the total time needed to bring the temperature up to the operating point, and any attempt to shorten this initial drying period, if it does not actually ruin the bench, is likely to increase the amount of maintenance work required during the life of the bench.

An Operating Test of the Maclaurin Gas Retort

A resume of the investigation reported by the British Department of Scientific and Industrial Research on this intermediate-temperature carbonizing system.

THE Department of Scientific and Industrial Research has been empowered by the British Government to make tests at the public expense of plants for the low temperature carbonization of bituminous coal. The present report describes a test of one unit of the Maclaurin plant erected at the Dalmarnock Gas Works of the Glasgow Corporation. The erection of the plant was completed early in 1925. It was started up on the 18th of June, 1925, and since this time has been worked intermittently, the actual working time until May, 1928 being about two years.

The carbonizing plant consists of five internally heated retorts or producers which have in common coal and coke-handling systems, a condensing system, and the necessary auxiliary plant, Fig. 1 shows diagrammatically the general lay-out of the plant, and Fig. 2, half-sectioned, an elevation of a producer unit.

The body of each producer is 20 ft. high, square in

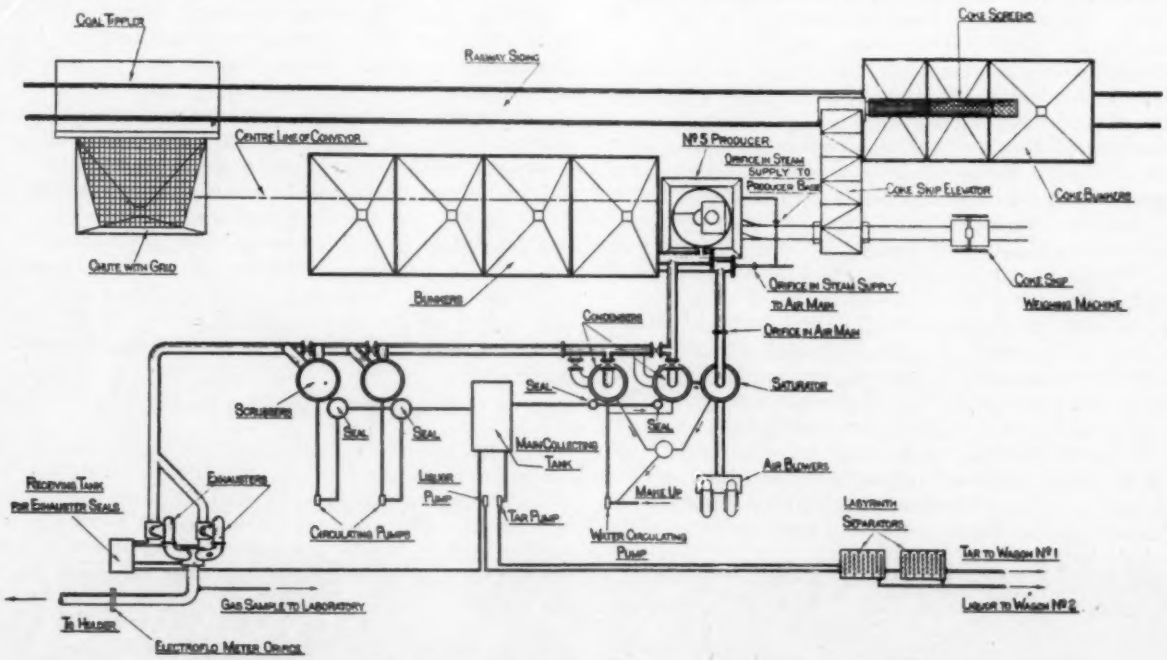


Fig. 1.—General lay-out of plant, Dalmarnock Gas Works, Glasgow, Scotland

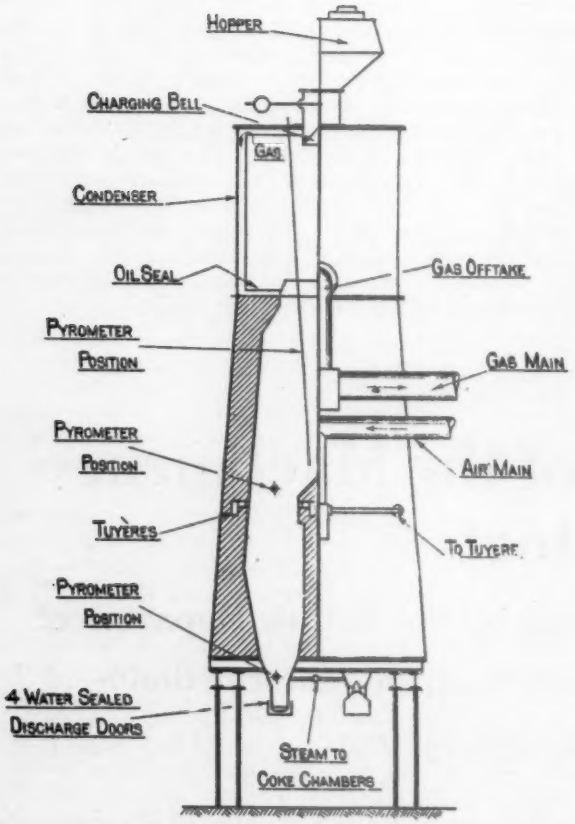


Fig. 2—Elevation of producer unit

cross-section, and is lined with 18 in. of firebrick. Except for the flat walls, it is in shape not unlike a blast-furnace, with a maximum width of 8 ft. 3 in. 15 ft. from the top. The retort then tapers uniformly in both directions and is 6 ft. wide at the top and 6 ft. 6 in. at the bottom. Near the base it is divided into two equal parts by a vertical wall, through which run a pair of air channels, each of which conducts air to a series of 20 horizontal nozzles. Facing these are similar sets of nozzles supplying air through two outside walls of the retort. The nozzles are situated 3 ft. 6 in. above the widest part of the retort.

The base of the producer is fitted with four water-sealed discharge doors, which are counterbalanced and are easily operated by hand by means of levers and suitable gearing. Provision is made above each discharge door for the admission of steam into the producer, the respective quantities being controlled by hand-operated valves.

Above each producer body is fitted a "condenser," consisting of an outer and inner circular wall. A free space is left above and below the inner wall and a tar seal is so arranged at the top of the producer body that gas can pass freely over the inner wall into the annular space between the two walls, but only tar and liquor can pass underneath. Situated near the base of the outer wall of the condenser is an offtake carrying the products from the producers into a main running along the whole battery.

Coal charging is effected, without loss of gas or intake of air, from a hopper situated above the condenser, sealed at the top by a hand-operated lid and at the bottom by a counterbalanced conical valve or bell. Provision is made for rodding the charge, pokeholes being provided at the top of the condenser and doors in the walls of the retorts.

Test Conditions

It was decided that the test could best be performed on one of the battery of five producers. Without elaborate apparatus it would be difficult to determine the influence of any variation in the performance of one producer upon the plant as a whole; the samples of coal, coke, and other products could be dealt with more conveniently, and, further, the testing staff and number of observations could be kept down to a practicable minimum. Blanks were therefore inserted in various pipes and connections, enabling the end producer to be completely isolated from the remainder of the battery.

The coal used for the test was supplied by the United Collieries, Ltd., from their Clydeside colliery at Uddingston, and consisted of the normal output from the Virgin seam. Screen analyses carried out on 6 cwt. portions of each daily sample gave the size of coal carbonized:—

	Per cent.
On 2 in. screen	48.1
Through 2 in. on 1 in.	28.6
" 1 " ½ in.	11.2
" ½ in.	12.1

The total weight of coal carbonized was 101.55 tons, with an average moisture content of 9.5 per cent. Its proximate analysis (air-dried) was:—

Moisture	9.2
Volatile matter less moisture	36.6
Fixed carbon	51.6
Ash	2.6
Calorific value (B.t.u. per lb.)	12,880

The ultimate analysis (dry coal) was:—

Ash	2.93
Carbon	79.00
Hydrogen	5.27
Nitrogen	1.99
Sulphur (combustible)	0.75
Difference (oxygen and errors)	10.06

During the test period no very serious difficulties were encountered in working the producer, but at times "holds-up" occurred, which necessitated shutting down the plant and rodding the charge until the coal was again evenly distributed. During the test of 120 hours the producer was shut down for intervals totalling 6.9 hours, the longest shut-down period being 1 hour. During the worst "holds-up," which occurred in the first three days of the test, it was found necessary to rod at the manholes as well as from rodding positions at the top of the condenser. Little trouble was experienced in working the producer during the last two days of the test, and it would appear that the claim of 20 tons per day throughput with this particular type of coal is justified.

Coke Extraction Satisfactory

The method of extraction of coke appears to be satisfactory. With the four discharging positions it is possible to regulate the flow of coal through the producer as desired. The coke on discharge was normally quite cool enough to handle conveniently, but at times, due to efforts on the part of the operator to speed up the throughput after shut-down periods, it was burning freely.

The coal is carbonized by the sensible heat of the products of combustion of a small portion of the coke,

which is consumed by the introduction of air at a position near the base of the producer. The system cannot be described strictly as one of low temperature carbonization, although the volatile products are removed at a relatively low temperature, since a part of the coke must pass the position in which combustion takes place and in which the temperature is not less than 1,000° C. Tests carried out on the coke produced during this test show, however, that the amount of coke which reaches this high temperature is small and is not sufficient to affect the value of the product as a domestic fuel.

Test Results

The weight, carbon and thermal balances show that the test has been satisfactory, and definite yields of products can be stated for the carbonization of this particular type of coal.

The yields obtained, calculated per ton of dry coal, were:—

Coke	12.12	cwt.
Tar	17.8	gal.
Gas spirit (crude)	1.5	gal.
Gas	33,160	cu. ft. =
	77.26	therms
Liquor	48.1	gal.
Ammonium sulphate (including that in gas)	41.9	lb.

The coke produced was well carbonized and contained 3.9 per cent. of residual volatile matter. The largest size marketed makes a good fuel for domestic purposes, and is little, if any, inferior to a low temperature coke prepared, in externally heated retorts, at 600° C.

The tar is of a primary nature and resembles in chemical properties a tar made from a coal of similar properties carbonized by external heating at 500° C. to 550° C. The yield of tar is 57.1 per cent. of the yield from the Gray-King assay.

The yield of ammonium sulphate is high, but the liquor produced is only of 6.2 oz. strength.

The installation as erected is economical in labor.

It was evident from examinations of producers which were not in use during the test that the temperatures attained in the producers were not excessive, as little deterioration of the brick linings was observed. This is confirmed by the fact that no clinker was produced during the test run. Temperature explorations in the charge gave a maximum value of 1,020° C. at a position 6 in. inside the brick wall and 12 in. above the air inlets.

Accurate Analysis of Gas Mixtures

For certain purposes extremely accurate analysis of gas mixture is necessary. One difficulty with usual methods of gas analysis is found in the deviation of gases like carbon dioxide from the gas law. In the analysis of hydrocarbons this results in serious error in determination of the carbon dioxide contraction ratio. Other errors result from solubility of gases in absorbing solutions, inaccurate gas burettes, poor meniscus in the burette due to dirty mercury, absorption and occlusion of gases in the copper and copper oxide in the combustion tube, uncertain temperature and volume of dead space in the manifold, leaks and absorption of gases through stockcock grease and rubber tubing, etc. The Pittsburgh Experiment Station of the United States Bureau of Mines, Department of Commerce, has developed a gas analysis apparatus with which it is hoped to eliminate most of the usual uncertainties. Although for a rapid and convenient analysis the standard types of apparatus are probably about as satisfactory as can be hoped for, a more accurate method is desirable in particular instances even though the labor involved in analysis is more than would be desirable in routine analyses.

New Methods for Obtaining Liquid Fuels

Within recent years, many radically new processes for producing industrially important materials have been discovered as the direct result of the knowledge accumulated during many years of research on chemical thermodynamics and kinetics, observes the United States Bureau of Mines, Department of Commerce. Among the oldest of these is the synthetic ammonia process which is now successfully competing with natural deposits as a source of nitrates. The synthetic methanol process is likewise competing with the wood distillation industry as a source of "wood alcohol." More recently processes have been discovered for the production of oils and motor fuels from coal by direct hydrogenation and through intermediate formation of water gas from coke. These latter processes, however, have not yet been widely applied commercially.

Another process, by which hydrocarbon oils and organic liquids are produced from coal through the medium of water gas, was announced by Fischer in Germany. Recently Audibert and Raineau have submitted to the French National Bureau of Liquid Fuels a comprehensive report of work on the development of this process. Although the catalysts necessary to this process have not yet been developed to the point of commercial application, it has been shown that the process holds considerable promise. For example, from 1000 cu. ft. of water gas 1 gal. of organic liquids and 100 cu. ft. of gaseous hydrocarbons can be produced. The organic liquids consist principally of hydrocarbons and alcohols. The gaseous hydrocarbons contain a large proportion of methane. It is to be expected that such processes will continue to replace the time-worn methods for obtaining the great variety of products so essential to modern civilization.

Since many of the newer processes start with coal or coke as a raw material and since the object of many of them is to produce liquid fuels, the Pittsburgh Experiment Station of the United States Bureau of Mines, Department of Commerce, has been active in work on the development of these processes.

Plan to Attend the A·G·A·Convention

Causes and the Reduction of the Water Content of Tar

By Dr. Karl Bunte

A Contribution from the Gas Institute

TAR can be dehydrated so that in most favorable cases it contains little as half a per cent water. It commonly contains three to four per cent water in the dehydrated condition, and at times the water content is as high as five per cent due to errors in the process. The causes of these disturbances are very numerous and just as many methods have been proposed for their elimination. The numerous inquiries that have come to the author at the Gas Institute and the experience gained in investigating numerous individual cases have convinced the writer that it would be advantageous to collate the authoritative viewpoints on the tar dehydration problem. The theories and the practical information that are discussed below have been confirmed by numerous gas chemists in their experience in the gas works and have also been supplemented by additional information available to the writer.

The separation of tar and gas liquor requires in the first place a certain period of time which depends on the physical properties which are described below. The viscosity of the tar represents a certain resistance, which acts against the separation of tar and gas liquor, and the difference in the specific gravity represents the energy of the buoyancy of the lighter water in the heavier tar, which tends to overcome this resistance. Thus, the final result and the time required for separation depend in the first place on the viscosity and on the difference in the specific gravity.

Influence of the Temperature

Inasmuch as the viscosity is decreased by rise in temperature, the resistance is consequently also decreased, and hence the water can be more easily separated from the viscous tar at higher temperatures. This is well-known. Certain determinations have been carried out with the aid of the Hutchinson apparatus, which afford an idea of the influence of the rise of temperature on the viscosity. The following tabulation shows the time of sinking of the testing device in an emulsion of road tar with thirty per cent of water.

Temperature degrees C	Temperature degrees F	Time of Sinking Seconds
25.0	77.0	23.2
27.8	81.0	18.0
30.0	86.0	11.4
32.5	90.5	6.2
35.8	96.4	5.0
37.8	100.0	4.0

The Hutchinson apparatus, in which the time of sinking of a spindle-like instrument is measured between two marks, is better suited for this determination than the ordinary viscosimeter. The viscosity of a thinly viscous tar was determined according to degrees Engler and the results are shown below.

Temperature degrees C	Temperature degrees F	Degrees Engler
40	104	6.4
60	140	3.5
80	176	1.9

The period of time required for the separation is accordingly always dependent on the viscosity of the tar, which is itself controlled by the temperature. Considerable practical use is made of the fact that the separation takes place more quickly from heated, thinly viscous tar.

Warm condensates (with the exception of light tar emulsions, which we will speak about later) separate more easily than cold. In order to dehydrate the tar thoroughly, it is heated up to a temperature of 60 degrees C (140 degrees F) by means of a steam coil before being filled into heat-insulated tanks, and then it is allowed to remain without agitation for two to three days. No additional heating is performed, for the reason that the separation would only be prolonged due to the increased circulation of the tar. The following experiment was carried out to substantiate this process.

Experiments Conclusive

An intimate emulsion of road tar, that is a water-free, rather thickly viscous tar, with thirty per cent water was heated on the water bath to different temperatures and then allowed to stand two hours each time without agitation at the desired temperature. The results obtained are given in the following table:

Temperature of Tar degrees C	degrees F	Separation of Water
25	77	almost no separation
35	95	large water bubbles formed which for the most part did not reach the surface
45	113	13 per cent separation
50	122	56 per cent separation
60	140	72 per cent separation
70	158	93 per cent separation

Practical results obtained at the Dresden, Duisburg, Munich and other German gas works substantiate fully the technical correctness of the practice of heating the tar for a short time and then allowing it to remain at rest.

It is also important to distribute the sale of the tar uniformly, in order to avoid too early disposal of the upper layers in the storage tank. A gas works, which establishes a standard uniform content of 0.9 to 1.5 per cent of water in its tar, will find that of the several tank cars of tar which are being disposed of the first two will contain tar with the standard moisture content, then one with 2.5 per cent water, then one with five to six per cent water and finally one with twenty per cent water.

The time required for the separation of the water from tar and the effectiveness of such separation are dependent in the second place upon the difference of specific

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gravity between gas liquor and tar, for this difference in specific gravity is the active force which engenders the separation. Hence, it apparently follows without argument that it is easy to separate heavy tar from light gas liquor. Nevertheless, this statement is correct only in a very limited sense, for tars with a high specific gravity are also thickly viscous tars. Such tars are subject in predominate degree to the first influence, as explained above. However, the conclusion that is drawn in the opposite sense, namely that very light tars and very heavy gas liquors are very hard to separate is correct. A gas works, which has to work under such circumstances, cannot help itself in any other way than to dilute the gas liquor. This quickly and effectively removes this highly disadvantageous operating condition.

The interesting question is how does and can it happen that light tar is obtained along with heavy gas liquor.

The specific gravity of gas liquor increases as its concentration increases, that is as the percentage of ammonium salts contained in it increases.

Hence, the specific gravity of the gas liquor is dependent upon the quantity of gas liquor which is separated from the gas at comparatively high carbonization temperature. If the amount of gas liquor formed is increased (that is by using a young coal, wet, washed coals, undecomposed steam from wet carbonization) then the greater part of the water is separated at high cooling temperatures, which means that it (the gas liquor) contains only a small proportion of ammonium salts and therefore has a lower specific gravity.

The use of dry coal and elimination of the steam result in an increase of the concentration and of the specific gravity of the gas liquor. The later, stronger cooling acts in the same manner due to the greater absorptivity of the colder condensate for ammonia.

Changing Specific Gravity of Tar

On the other hand the specific gravity of the tar is changed in the following manner:

First, a change may be effected by complete or partial conversion to another oven system. Tars from the horizontal retort have a specific gravity of 1.2 on an average. On the other hand, tars from the inclined retort have an average specific gravity of 1.15, while tars from the vertical retort and the chamber oven have an average specific gravity of 1.1. It is also true that tars of still lower specific gravity are obtained from ovens in which the coal is in motion while it is being carbonized.

Another way in which the specific gravity of the tar can be changed is by changing the method of operating the ovens. Higher carbonization temperatures and increased exhaust through the exhauster yield heavier tars due to the overheating effect which is thereby produced.

On the other hand, the carbonization of wet coals (washed small sized coal) yields lighter tars.

A charge can be effected in the specific gravity of the tar by properly selecting different types of coals. Thus, the most striking cases in which dehydration of the tar has to be given up are when wood and lignite coal are carbonized. Other factors are also responsible for this. On the other hand certain younger varieties of anthracites will yield more thinly viscous and specifically lighter tars than older coals when the carbonization is carried out under like conditions in both cases. The highest boiling, heaviest and most viscous tars are separated from the gas in the condensers, somewhat lighter tars in the air cooled tar separators and the lowest boiling, lightest and most liquid tars in the later stages of cooling the gas.

Tar and gas liquors, which are obtained from the coolers, scrubbers and the other parts of the purification apparatus, are often collected together and carried over into a collecting or separating pit, in which the tar and gas liquor are allowed to separate according to their specific gravity. The gas liquor accordingly rises to the top and is drawn off, while the tar sinks to the bottom and is removed through a suitable pipe. The gas works at Stuttgart reports that it is advantageous to allow the flow of tar and gas liquor to enter the pit in a wide stream at about the height corresponding to the location of the separating surface between tar and gas liquor.

Correct Arrangement of Overflow

The third important factor, which enters into the separation of the tar from the gas liquor, makes its appearance in the tar pit wherein this process is performed. This is the hydrostatic law. The overflow of tar is arranged to take place at a lower point than the overflow of the ammonia liquor due to the higher specific gravity of the tar. It, therefore, follows that the correct arrangement of the mutually inter-related points, at which these overflows or removal of the separated layers of tar and ammonia liquor take place, with respect to the difference in the specific gravity and in ratio to the depth of the pit has a considerable influence in establishing the preliminary separation of tar and ammonia liquor.

It may first be assumed that the tar, which is located both outside and inside the tar overflow pipe, has the same specific gravity. Hydrostatic equilibrium then sets in at the depth of the separating surface between the tar and the ammonia liquor. This separating surface between the tar and the ammonia liquor appears at such a point in the pit that $h_t.s_t = h_w.s_w$. This means that the depths of the tar and the water columns (h_t and h_w), which maintain the equilibrium, are inversely proportional to the specific gravities, s_w and s_t. The less the differences in the specific gravities, the greater must the overflows h_t and h_w be at a given difference in head, and hence the lower in the pit will the separating surface between the tar and the gas liquor be located. On the other hand, the lower this is located, the shorter the time period during which the tar has to remain in the pit in order for the water to be separated from it, before it enters the tar outlet pipe. Or, if a sufficient period of time for separation is maintained through the distance between the separating surface and the lower end of the tar pipe, then the difference between the heads h_w and h_t must be smaller in proportion to the difference in the specific gravity. The heavier the specific gravity of the gas liquor, the lighter the tar; hence the deeper hydrostatically the separating layer in the tar pit, and the shorter the period of time that the mixture has to remain in the separating pit.

Variation in Location of Outlets

The following conclusions can be drawn at this point. The lesser differential in specific gravity of the tar and the gas liquor requires lesser differential in the depth at which the outlets are located for the initial, thorough separation of the tar and the liquor. Several works, accordingly, possess tar slide valves which afford an opportunity of throttling the outflow of the tar.

For a given difference in level between the two outlets, the time that the mixture has to remain in the settling pit, which is determined by the depth of the separating surface with respect to the lower end of the tar pipe, is shorter, the less the difference in the specific gravity.

The time that the mixture has to remain in the settling pit so that the tar and water are separated in the initial separating process is dependent on the diameter of the settling pit as well as on its depth. The narrower the settling pit, the shorter this time period, and consequently the stronger the influence of the position of the separating surface. Hence, settling pits, which are as deep as possible and roomy in comparison with the quantity of material put through them, are the first prerequisite for good separation.

The gas works at Stuttgart, Germany have found that the aforementioned exposition also affords an explanation of the fact that the present tar separators on the water-less gas holders are too small, and in spite of the fact that they are heated do not effect dehydration of the tar in the winter-time. Such dehydration of tar is generally not necessary in summer, for the water emulsion is just is good a sealing liquid as tar itself. It is different, however, in the winter. It appears necessary then to collect the outflowing tar in a large, heatable tar container and to separate the water from the tar, and to feed tar from the tar tank to the pumps that raise it to the top of the holder. What has been said is particularly important for such holders, which are used in storing water gas.

The time that the tar and water mixture has to remain in the settling pits is furthermore dependent on the quantity of tar that is removed from the gas in a unit of time. The greater the precipitation of tar, the shorter the settling period (continuous or periodic overloading the settling pits). A speed of 0.1 millimeter per second (.025 inch per second) is assumed to be normal for the flow of tar and of 0.4 millimeters per second (0.1 inch per second) for the flow of water.

Change in the Ratio of Specific Gravity Due to Heating

The idea, that the viscosity of the tar is lessened by heating, which consequently enhances the rapidity and completeness of the separation, must be subjected to certain limitation, when emulsions of light tars and gas liquor are being treated. In the first place the specific gravity of the emulsion of tar and water is less than corresponds to the law of mixtures. The separation of water from the emulsion is thereby retarded. The following data were obtained from a series of experiments on this subject.

Water Content	Specific Gravity	
	Found by the Pycnometer	Calculated according to the law of mixtures.
Percentage		
0	1.186	——
10	1.172	1.180
15	1.159	1.167
20	1.147	1.158
	1.139	1.148

The coefficient of expansion of water and of the tar ingredients is very different. This is the most important point. At a temperature differential of one degree C the coefficient of expansion for these different substances are as follows:—water 0.00018, benzol 0.00120, toluol 0.00110, xylols 0.00100 and naphthalene 0.00032. The coefficient for tar is 0.00049 to 0.00067. The coefficient of expansion is, therefore, almost ten times as large as that of water in the case of the light tars and almost three times as great in the case of ordinary tars.

The specific weight of thin tars, which contain much light hydrocarbons, is also considerably more quickly reduced by heating than the specific weight of water. As the temperature rises, the specific weights approach each other. Hence the increase of the temperature not only does not enhance the separation of emulsions of thin tars with water, in which the decrease in the viscosity plays no important role, but separation is actually retarded. In such cases the tar sinks to the bottom while the water rises to the top. Such emulsions separate into their constituents rather more difficultly at higher than at lower temperatures. The existing tendency of the formation of tar ingredients, which float on the surface of the mixture, is enhanced by increasing the temperature.

Influence of Cooling

Change in the ratio of the specific gravities is consequently determinative as far as the position of the separating surface is concerned and hence for the period of time that the emulsion has to remain in the tar pit, when certain given dimensions are assumed for the latter.

A great increase in the quantity of gas or the practice of producing water gas within the carbonizing retorts and the like may have an important effect on the cooling of the gas, the undecomposed steam strongly affecting the cooling process. The largest portion of the tar, namely the heavy tar ingredients with a portion of the gas liquor, run out of the condensers and the air coolers, but in water-cooled coolers a lighter tar is precipitated along with cold gas liquor saturated with ammonia salts.

For example, the specific gravity of the gas liquor at a temperature of 15.5 degrees C (60 degrees F) is as follows:—from the condenser 1.011, the first cooler 1.035, the second cooler 1.075, the third cooler 1.115 and the fourth cooler 1.120.

It, therefore, follows that the tar and gas liquor from the condenser and the air coolers possess markedly different specific gravities, while the tar and gas liquor that are obtained in the remainder of the purification system are very close in specific gravity and hence remain emulsified. When the flow of the gas liquor and tar mixture first enters the settling pit, the heavy tar sinks to the bottom without mixing with the lighter tar. It is therefore advisable to allow the tars from the different stages in the purification system to mix as long as possible before they enter the settling pit, and according to the experience of one gas works, it is advisable to allow the heavy tar to form a layer over the lighter tar.

The conclusions that may be drawn at this point are as follows. Overloading of the normal cooling process and quick after-cooling must be avoided, as otherwise thin tar emulsions will be formed. When heavy and light tars are precipitated at different points in the condensation process, they are mixed together before entering the settling pit. Then on the one hand the heavy tar will become less viscous and on the other hand the tendency of the light tars to form emulsions with water will be diminished.

Emulsion Formation Due to Absorption and Colloids

These purely mechanical and hydrostatic influences are not sufficient to explain in many cases the difficulties, which assail the separation of water from tar. According to the author's experience, they afford a simple explanation in most instances in one way or another, so that the following additional causes of stubborn retention of water first come into play, when the aforementioned causes fail to yield the proper explanation and suggest the proper remedy.

The complicated conditions of surface tension may enter into this problem to make it more difficult, inas-

much as great surface tensions prevent the agglomeration of the originally small particles of water and their rise in the tar.

Attention has been called to the presence of free carbon in the tar and to the comparative frequency with which this substance promotes the formation of tar and water emulsions. The portion of tar, which is designated as free carbon and which is insoluble in most organic solvents, is partially actual free carbon, which has resulted from the pyrogenetic decomposition of the hydrocarbons. It also consists in part of flue dust, as is indicated by the ash content. However, as the analytical detection of hydrogen indicates, it consists in the greatest portion of high molecular weight and hence insoluble products of pyrogeneous decomposition. When gas reaches the dew point due to cooling, then the moisture is precipitated on the particles of carbon, which act as centers of condensation, and hence the water passes over into the tar. This surface combination of the water and the tar does not decompose due to the difference in the specific gravity of the water and the tar. Inasmuch as the content of free carbon is due to the same causes—namely overheating—as the formation of thickly viscous tars, hence the two causes and effects must not be interchanged. Tar which contains carbon is at the same time and according to its very nature highly viscous.

Another phenomenon which enhances the stubborn retention of the water by tar is the action of substances which facilitate or promote solution. This phenomenon will be best explained by means of a technical example not connected with this particular problem. Certain substances, such as the higher phenols, (the so-called cresols of lignite tar) are to be sure insoluble in water, but due to their easy solubility in alcohol they are likewise soluble in aqueous alcoholic solutions. The alcohol acts in the manner of a solvent or as a solution-promoter, on the one hand between water and on the other hand the higher phenols. In the same manner the lower phenols of certain tars can also act as solution promoters. It is true that the tar cannot be mixed with the water, but the lower phenols are miscible with water and also with tar. They can, therefore, promote the stubborn retention of the water. This happens when phenol-rich wood tars and tars obtained from the gas made from lignite coal are being handled. Furthermore, the phenolic soaps, which are formed between ammonia and phenols, can also act as emulsifying agents.

Finally, the colloid-forming agents, for example those obtained as by-products from resins, can also play a certain role in this connection. There is not such definite information available on this subject as on the remainder of the problem.

It is therefore evident that the difficult separation of water from tar is caused by many factors. What has been said above regarding certain operating conditions should be of some help to gas engineers, even though they may be contradicted or substantiated as the case may be according to the experience of the gas man.

Effect of Repeated Exposure to Carbon Monoxide

Public Health Bulletin No. 186, "Effect of Repeated Daily Exposure of Several Hours to Small Amounts of Automobile Exhaust Gas," published by United States Public Health Service, contains some information of value to the gas man, particularly as it might apply to workers about gas plants who are subjected to mild exposures of CO because of the working conditions where they are employed.

The Bulletin draws the following conclusions:

In summing up the results of this investigation in which six men were exposed four to seven hours daily over a period of 68 days to gasoline engine exhaust gas-air mixtures containing 2, 3, and 4 parts of carbon monoxide per 10,000 parts of air, the following conclusions are apparent:

1. Exposure to 2 parts CO to 10,000 parts of air caused some subjects at rest or exercising mildly to experience slight but not discomforting symptoms in approximately two hours and distinct frontal headaches of a discomforting nature in three and one-half to four hours. No symptoms of any type were experienced in more than 50 per cent of the exposures, and no occipital headaches occurred in any subjects even after six and one-half hours' exposure. The blood attained 20 per cent carbon monoxide-hemoglobin in three and one-fourth to four and one-fourth hours and 25 per cent in five and six hours, depending on the person and whether he was at rest or exercising mildly.

2. Exposure to 3 parts CO to 10,000 parts of air caused some subjects at rest or exercising mildly to experience slight symptoms in less than two hours and distinct frontal headaches in two and one-half to three hours. A few occipital headaches and cases of Vertigo occurred after three hours. In more than 65 per cent of the cases, distinct discomforting symptons were experienced after five hours' exposure. This concentration produced 20 per cent carbon monoxide-hemoglobin in the blood in two and one-half to three and one-half hours, 25 per cent in three to four hours, and 30 per cent in four to five and one-half hours, depending on the subject and whether he was at rest or exercising.

3. Exposure to 4 parts CO to 10,000 parts of air caused some subjects to experience frontal headaches in one and one-half to two hours. A few occipital headaches occurred in two and one-half to three and one-half hours. At the end of three and one-half to four hours more than 90 per cent had distinct frontal headaches.

The blood attained 20 per cent carbon monoxide-hemoglobin in one and one-fourth to two and one-fourth hours, 25 per cent in two and one-fourth to three and one-fourth hours, and 30 per cent in three to four hours, depending on the subject and whether he was at rest or exercising mildly.

4. Although there was a tendency for headaches to appear with a lower amount of carbon monoxide-hemoglobin when attained by exposure to the lower concentrations of carbon monoxide, in general, frontal headaches just begin in some subjects when the saturation reaches 18 to 20 per cent. A few distinct occipital headaches accompanied by vertigo occurred at 23 to 28 per cent.

5. Exercise, even though of a mild form, distinctly augmented the absorption of carbon monoxide and caused symptoms to appear after shorter exposure.

6. The rate of elimination of carbon monoxide from the blood in a given period after exposure varied directly with the initial saturation, but for the initial saturations attained in this study the rate of elimination

appears the same for the same range of saturations—that is, it is the same between, say, 25 and 20 per cent, also regardless of whether the initial saturation was 25, 30, or 35 per cent. After an initial saturation of 35 per cent was attained, approximately one-half hour was required to lower it to 30 per cent, about one hour more to lower it to 25 per cent, nearly one and one-half hours to lower it to 20 per cent, nearly two hours more to lower it to 15 per cent, two and one-half hours more to lower it to 10 per cent, and three to five hours longer to lower the saturation to 5 per cent, if the subject breathed air the entire time. For lower initial saturation the time required to eliminate the CO to a lower saturation was the same as the portion of the above which corresponded to the values in question.

7. A 30-minue inhalation of oxygen or 5 per cent carbon dioxide in oxygen reduced the amount of carbon monoxide-hemoglobin from 35 per cent to less than 10 per cent in 30 minutes, and when given immediately it alleviated the symptoms. For lower initial saturations the same effect was produced in somewhat less time.

8. Exercise immediately after exposure markedly increased the speed of elimination. This procedure, however, is not recommended or advised as a treatment for poisoning by carbon monoxide.

9. There were no apparent signs that the tests produced deleterious effects to the health and physical well-being of the subjects. No lack of appetite, change of weight, or muscular weakness occurred.

10. In general, a distinct increase in hemoglobin occurred. This was accompanied by an increase in red blood cells. No important change occurred in the leucocytes.

11. With the exception of a few occurrences of traces of sugar, no important changes or abnormalities were noted in the urine. Tests for blood pigment were negative.

12. Psychological analysis employing tests that were thought would reveal any difference occurring in the performance of the subjects after exposure to carbon monoxide in the concentrations given failed to show any distinct effect due to the gas, although there was a slight tendency for a poorer performance to be made on a prolonged steadiness test. The difference in performance on all other tests was no greater than the variation on successive control tests.

Concern Serving Delicatessens Economizes With Gas

By J. B. Nealey
American Gas Association

THE delicatessen store is another product of modern civilization and has grown greatly in recent years until today it is numbered among the country's largest businesses. Back of the delicatessen is the assembly, preparation and distribution of provisions sold by the delicatessen, and at the present time this constitutes another gigantic enterprise.

Among the large provisioners of delicatessen stores and one handling a complete line of delicatessen store supplies, is the concern of Bohle Incorporated of New York City. This firm maintains a 24 hour service and keeps four iced automobile trucks busy continuously supplying between 500 and 600 delicatessen shops in New York and vicinity. While a full line is handled by this company including smoked fish, domestic and imported cheeses, etc., it specializes in hams, corned beef and roast pork.

Having outgrown its old quarters through increased trade, this firm recently built a new and modern plant which represents the last word in sanitary and mechanical perfection.

The hams prepared in this plant have been corned in sweetened brine and are known as "sweet pickled boiling hams." When received they are put into soaking vats of hot water which performs the dual function of cleaning and softening.

In one end of the main room is a series of long tables at which the men work. As soon as the hams are sufficiently soft they are placed on these tables and the men remove the bones, loosen the skin and take off the proper amount of fat.

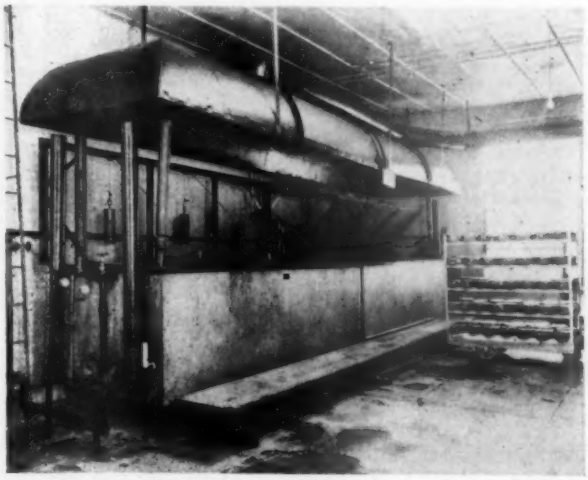
In preparing the hams for boiling, two methods are used. In the first method they are put into heavy aluminum containers under pressure. There are three shapes, oblong, pear-shaped and truncated, and different sizes in each shape of these containers to accommodate different weight hams. Pressure is supplied by springs on the covers and the hams are always under pressure whether expanding or contracting. When processed the hams are so shaped that they can be cut up on the slicers without waste.

The other method is that of making them up as "round" or "string" hams. These are not put into the ham boilers but are tied up with string in the old fashioned way of years ago when that was the only type known. These are wrapped in canvas-like cloth and boiled in the tanks among the aluminum forms or containers.

For this operation three tanks are provided, two large and one smaller in size. The larger ones each measure 14 ft. in length, 5 ft. in width and 4 ft. in depth and hold 150 to 210 hams each which are boiled for about 5½ hours at temperatures ranging from 170 to 180 deg. F.

These tanks are of sheet steel with insulation between, which serves to conserve the heat, lower the fuel con-

sumption and improve working conditions. Gas fired immersion heaters, two in each tank, are used to heat the water. These consist of a loop of 6-in. steel pipe laid on the bottom of the tank and running from one end to the other and return, so that the two open ends protrude through one end of the tank and about a foot apart.



Tanks heated with gas-fired immersion heaters for boiling hams

One of these is welded into the end of the tank and the other is bent at right angles and runs up under the hood where the waste gases are vented to the outside air. A gas burner is set opposite the lower open end of the pipe and fires directly into it, the hot products of combustion traversing the length of the pipe and return thereby heating the water in the tank.

The burners used are the open end type with pilot lights built into them to hold the flame from being blown away. The gas is boosted to four pounds pressure and air is sucked in at the injector to form a gas-air mixture which will give complete combustion. A rotary air-cooled gas compressor, with pressure oiling system and by-pass relief valve built into it, is used to boost the gas pressure.

Close Regulation

This relief valve can be set to open at different pressures, but, as it operates by gravity it is weighted to open at four pounds on this particular application, so that any excess gas delivered by the compressor is immediately by-passed to the suction slide. One feature of this installation is that the gas can be turned down to half a pound without any danger of back-firing, or of changing the gas-air ratio. The efficiency of this unit is above 80%.

It seems to be a popular belief that all boiled hams are smoked at some time or another but this is an error. The exception is the Virginia Style ham and in making up this specialty a string ham is used and is smoked before boiling. These are the only boiled hams that receive any smoking.

A gas-fired, sheet steel smoke oven is provided for this operation. This smoke oven is 6 ft. square and 12 ft. high and the walls, roof and floor are constructed of double steel sheets with asbestos insulation between as in the boiling tanks. Three long gas pipe burners extend from front to rear and are located about three inches above the floor. A rack of hams is run into the oven, the floor covered with hickory or cedar sawdust and the burners lighted. Heat from the gas flames causes the sawdust to smolder and smoke and the excess smoke is removed through a flue which runs into a tall chimney." Natural draft only is used.

While hams, beef or other meats are smoked in this oven for periods ranging from one to five hours, the burners are kept lighted for only about half an hour, for the sawdust will continue to smoke for a long time after the action has once been started, without more heat.

Refrigeration is the next important step in processing the hams which are first allowed to cool to room temperature. They are then put into the first automatic refrigerating box at 45 deg. F. where they are allowed to stand for a day when they are transferred to another box at 36 deg. F and left for another day. They are then ready for delivery in the iced trucks.

Gas-fired smoke house and boiling tank. Note twin compressors for burner control in foreground

Roasting of various kinds of meats is accomplished in a gas fired oven 4 ft. square and 5 ft. high which is divided into four compartments by iron grids or shelves. Each compartment is provided with a door. Five gas burners, located in the front section and close to the floor, fire into the interior of the oven, and as the compartments are separated only by iron grid shelves, the one set of burners is sufficient to heat the entire unit.

Copper is Not Perfect

Copper, like most metals, has its disadvantages as well as advantages and to say that nothing affects copper is certainly incorrect.

For instance, any man who has had anything to do with refrigerating machinery and ammonia gas knows that ammonia does affect copper very much. For that reason brass and copper parts are never put into ammonia machinery.

In some parts of the United States even the water is exceedingly hard on copper tubing and piping. Thus I know of one instance where copper tubes in a stream condenser last only a year at their very best owing to the bad water in that vicinity. Copper tubing is persistently used, however, because it is the best material they can find for the purpose.

For most water handling purposes copper and bronze piping are very good. Copper and bronze wire cloth also are decidedly superior to iron wire cloth and even to galvanized iron wire cloth according to my own personal experience.

W. F. SCHAPHORST.

I—Competitive Fuels

BEFORE entering into the study of gas in relation to competitive fuels, it may be well to refresh our minds on the facts that show that gas is not, as so many believe, a monopoly, but actually subject to keenest competition. So many customers dismiss the gas industry with the statement that it is a state protected monoply. This view is only too often helped along by the sensationalists playing on class prejudice for the purpose of personal popularity.

Why the Coal Range?

Everyone in gas sales work knows most certainly that gas is competitive. Those who serve districts such as New York City cold water flats, where neither heat or hot water is supplied will know that in about 50% of these flats combination coal and gas ranges are installed. If gas is in a class alone, why the coal range? Simply because coal even in 100 and 200 lb. bags is cheaper for the dual purpose of heating the flat and cooking than gas or any combustion using gas can be for the heavy winter months. The many advantages of gas are well appreciated by these customers, whose average sales per meter are among the highest, but the one disadvantage of overall cost is the big obstacle. The quality and price of these combination ranges are not low, but compare favorably with the best gas ranges (without oven control and other accessories) to be found on the Gas Company show floors. First cost, then, even for the householder, is not a prime objection in fuel selection. Public Service Commissions have generally approved of the adoption of rates for competitive business. In other words, where an existing schedule does not offer sufficient inducement for the use of gas fuel, the principle has been approved by the Courts and Commissions of the introduction of special rates making it possible for the gas companies to compete on a cost basis with coal or oil.

These two illustrations have been introduced to show that gas is indeed a competitive fuel and not a monoply by State grant. Just to get an overall glimpse of this industry, two phases should be considered. First, what is the public's idea of its value, and second, what kind of a business is this competitive gas business.

It is not greatly out of line to say that the public has invested 5 billion dollars in the gas industry. With the recent developments in longer distance transmission lines, the investment is perhaps even more, but 5 billion is a safe approximation. How much this actually conveys to the mind is difficult to say, but consider it from this angle. Suppose all this 5 billion dollars was to be delivered to a bank in the form of $20 gold pieces. Five ton dump trucks are to be used and 3 loads can be delivered, dumped and trimmed every hour. How long would that delivery take? Let's assume that the first truck started the first minute of the New Year, and trucks arrived, backed in, dumped and departed day and night. The last truck would just finish at 11:30 A. M. on January 26th. "Believe it or not," that's what the value of the gas industry means in $20 gold pieces. And that does not include isolated producer plants and blue gas sets used by a single plant.

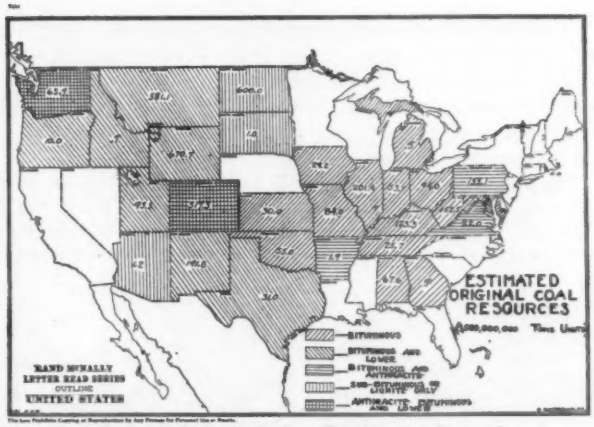
With this immensity, however, the average sale is too small for any retailer. No sales or delivery system would care to undertake such a picayune business. Considering that one large manufactured Gas Company sold about 45 M. million cu. ft. in 1928 to its 1,150,000 customers, there was delivered daily to the average customer about 8 lbs. of coal and 1¼ pints of oil. Imagine that for the sale of a commodity! With such units of sale, it can be seen that the industry does not sell a commodity, but only a service. Considering the efficiencies of utilization, the average annual sale of 41 M. cu. ft. per meter replaces 3 tons of coal. The 41 M. cu. ft. at a rate of $1. per M.cu. ft. does the cooking, supplies hot water, and heats rooms at a cost of $41. compared with $45. to $60. for coal, and with much greater satisfaction. The "gas house" efficiency of converting coal to heat through gas is so far ahead of the home conversion of coal to heat that the higher priced fuel comes out ahead. It is idle to say that the home offers no additional gas outlets, for there is water heating, house heating and cooling, refrigeration, laundry uses, incineration and who knows what new developments may result at any minute. An increase in domestic utilization means long tedious household education before the annual sales per meter increases greatly. The sale of refrigerators to 5% of the customers increases the sales per total meters only 2¼%. Incineration has the same effect. Laundry equipment a trifle less. The total effect is good, and the addition of a refrigerator will in most cases make a profitable customer of a losing one. The sale of gas for industrial uses, and since in many companies industrial includes house heating and restaurant equipment, is no less difficult than domestic selling, but the results are more fruitful.

Having in mind, then, the size and service rendered by the gas industry, the characteristics of fuels competitive with gas can be considered. In this summary, fuels are discussed from the standpoint of distribution, physical and chemical properties, storage and handling, and utilization. The comparison of advantageous and disadvantageous characteristics will be deferred until a succeeding article.

Coal—Its Distribution, Use and Properties

1 Distribution.

Coal of various grades is found very widely distributed, particularly throughout the United States. It is reliably estimated that within 3,000 feet of the sur-



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face of the ground there are 500,000,000,000 tons in Pennsylvania, of which 90% is bituminous. In the Mississippi Valley there is equally as much. Colorado and the other states of the Plains and Rocky Mountains have very abundant supplies of all grades, with a tendency towards grades below bituminous. Great quantities of sub-bituminous coal is also found on the Pacific Coast and well over 1,000,000,000,000 tons of lignite are to be found in the 4 states of Arkansas, North Dakota Texas, and Montana.

2—Physical and Chemical Characteristics

A. Composition: Varies from lignite with high moisture, volatile and ash content to anthracite with low moisture, volatile and ash content. Even within single shipments, composition varies widely. The standard methods for coal analysis call for quite elaborate sampling methods. Usually high sulphur content.

B. Heating Value: Dependent more on volatile constituents than on fixed carbon. Almost a direct function of the ash content.

C. Combustion: Slow because of particle size and difficulty of producing an intimate mixture of fuel and air. Combustion products consist of CO_2, N_2, O_2, free C and CO., the two latter soon after firing. In high temperature work, forced draft is needed which causes fusion of ash and loss of heating value because of embedded fuel. At lower rates, impossibility of intimate contact brings about a loss in combustible in ash equal to or greater than ash content—e.g.—the residue from a coal of 15% ash is usually 30% the extra 15% representing unburned carbon.

3—Storage and Handling

Coal must be delivered to a house in bags or by truck, and provision made for storage. Differently sized coal must be used if this fuel is used for cooking or water heating and house heating. The fuel capacity of a cook stove or water heater and the comparatively rapid heating period, make a small size coal necessary. On the other hand, the requirement for boiler or furnace firing is for a large size coal. For kitchen use, coal is carried from the bin to the stove in scuttles. The ash which amounts to about 30% of the weight of coal fuel must be carried out which is objectionable.

4—Utilization Problems

A. Combustion: To burn coal, three distinct steps must occur. The first step consists of oxidizing the coal to a gas, carbon dioxide. This gas rises through the glowing fuel bed and is changed to carbon monoxide. When this gas meets the secondary air it burns with the characteristic choppy blue flame of a coal fire. When a coal fire is blazing just after adding coal, much smoke is produced because the stove is not designed to give proper and complete combustion during such periods.

B. Effect on Stove Linings: Coal ash at the high temperatures met during a fast fire melt and form clinker. The ash also fuses with the stove lining, causing this to crumble quickly. The ash protects part of the iron grates, causing overheating and burning out of the grates not so protected.

5—Fuel and Labor Costs

A. Fuel Costs: On the heat unit basis, coal is usually the cheapest fuel. At $15. per ton for high grade anthracite coal, the cost per million B.T.U. is 63 cents.

B. Labor: The labor involved in using coal consists of coal handling and firing, watching the fire, shaking and removing ash and clinker. It is impossible to set a value on such labor, although a usual charge for tending house heating furnaces is $15 monthly.

Characteristics of Oil for Domestic Purposes

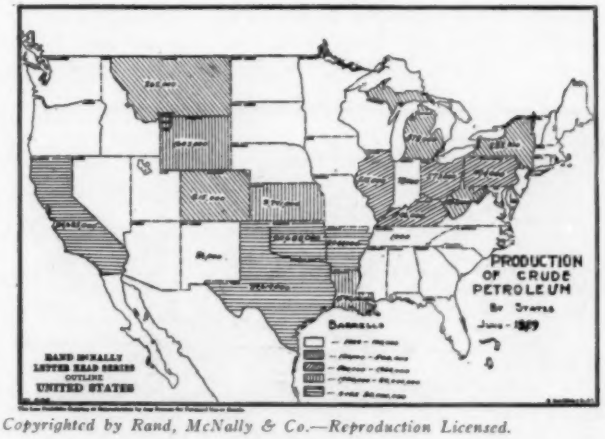
1—Distribution

Oil is found in several areas in the United States in pools. The more important of these are the Appalachian, covering the states of Pennsylvania, West Va. and Ohio; Lima—Indiana; Gulf Coast, covering the states of Louisiana, Texas and Oklahoma; Rocky Mountains, chiefly centered in Montana and the Pacific fields of Southern California. In spite of the great use of oil, the reserve estimated as remaining in the ground seems to remain about the same, as newly discovered fields makeup for the oil used. However, the demand for gasoline has changed refinery practice so that the tendency is for production of two grades only, gasoline and a heavy fuel oil fraction. The intermediate grades, kerosene, etc., will cease to be made except during periods of dumping.

2—Physical and Chemical Characteristics

A. Composition: Varies from light oil (kerosene and red oil) to heavy pitch, excluding gasoline.

B. Heating Value: This varies but slightly, being between 18,000 and 19,500 B.T.U./lb.



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C. Combustion: Dependent on the ease of conversion into gas. Light oils as kerosene vaporize readily and combustion is very rapid. Heavy oils with high flash points vaporize slowly and give delayed combustion. The products of combustion are CO_2, CO, H_2O, N_2, O_2 and free carbon. The latter results from dissociation of the hydrocarbons in the flame before combustion. Incidentally, the free carbon referred to is a source of lamp black.

3—Storage and Handling

For domestic purposes, oil is delivered by can or tank wagon. For cooking, water heating, etc., containers of about 1 gallon capacity are filled from the can. For house heating, oil is fed to the underground storage tank directly from the tank wagon, being pumped from there to the oil burner. As oil burns completely to gaseous products and collodial carbon (smoke) the problem of ash removal is non-existent.

4—Utilization Problems

A. Combustion: Oil must be gasified before combustion. In lamps, stoves, etc., the heat of the flame is sufficient to gasify the volatile kerosene used for such purposes. By using a metal stack to conserve heat, blue flame combustion can be produced. On furnaces and larger requirement heating appliances, either mechanical atomization or supplementary heat is used for gasification.

Oil burns to CO_2, H_2O and N_2. Because of incomplete combustion CO and oxygen are usually present in flue products. The combustion of oil produces about 15 lbs. of water per 100 lbs. of oil. It should be mentioned that it is extremely difficult to burn oil without producing some smoke.

B. Auxiliary Equipment: For gravity feed appliances, no auxiliary equipment other than fuel container is needed. For pressure type appliances, oil pumps are needed and air blowers for supplying air for atomization and combustion. Gas or electric ignition devices are also required for such systems.

5—Fuel and Labor

A. Fuel Costs: On a heat unit basis, kerosene oil at 17 cents per gallon (50-gal. lot price) costs $1.215 per million B.T.U. Fuel oil at 10 cents per gallon costs 69 cents per million B.T.U.

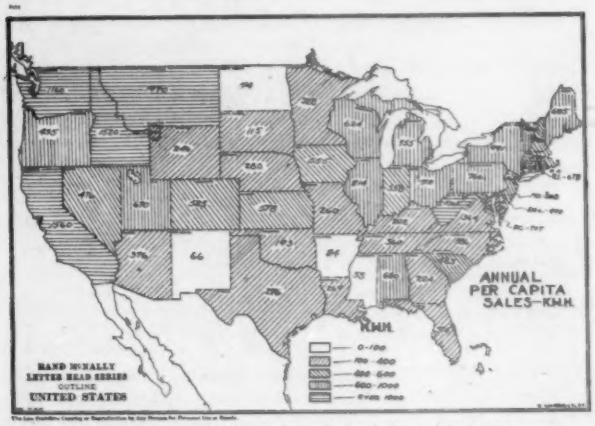
B. Labor: On gravity type appliances the labor consists of filling fuel containers and cleaning wicks, etc.

The pressure type appliances are automatic, requiring little or no labor.

Electricity

1—Distribution

Electricity is available in practically all sections of the country. It is generated from coal, oil gas and water power. Coal will always be the basis for the production



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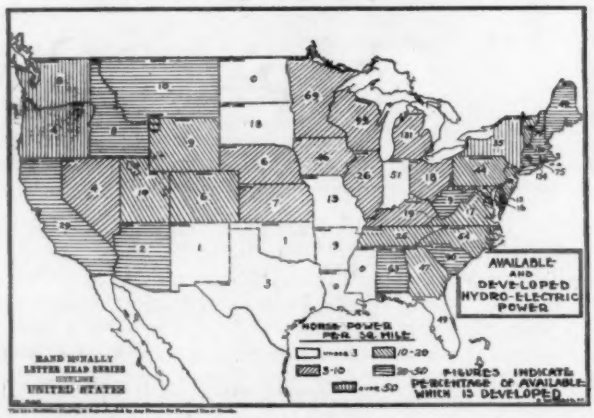
of electricity, although the use of natural gas and oil for this purpose is steadily increasing. While water power will be an important source of electrical energy, the potential water power available and its geographic location make it impossible that the dreams of the hydro-electric advocates that white coal will dominate can ever come true. The maximum available water power can never supply more than 10% of the fuel requirements. Geographically, however, more than 65% of the potential power is in nine states of the Pacific Coast and Mountain States.

2—Physical and Chemical Characteristics

A. Composition: As electricity is an energy it has no definite chemical composition. It is, however, supplied in different voltages and frequencies. For indus-



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trial heating the usual utilization voltages are 115, 230 and 460 volts. Distribution voltages commonly used are 2300, 4000, 11,500 and 22,000. Single phase current is supplied only infrequently, the majority of industrial current supplied being 3 phase, with 2 phase following close thereafter. 60 cycle alternating current is the usual frequency, although a few sections are still supplying 25, 40 and 50 cycle current.

B. Heating Value: One KWH of electricity corresponds to 3412 B.T.U.'s.

C. Combustion: Electricity being an energy, no chemical reaction takes place in the production of heat. Heat is produced by the resistance of the heating elements to the passage of the current in domestic applications.

3—Storage and Handling

Electricity is supplied directly from the central station. There is no unloading, storage or ash removal to be considered.

4—Utilization Problems

For domestic purposes the simplest method of changing electricity to heat is used, which is the resistance element. The usual type consists of a simple coil of heat resistant wire, the length and cross sectional area determining the amount of heat produced. Because of the low heating value per unit (3412 B.T.U. per KWH, i. e., 9 ampers at 110 volts for an hour) the service lines must be quite heavy. For an electric cabinet range with oven and four top burners, power lines equal to those used for 10 H.P. motor are required. The products from electric heating, except such as may be given off by the material, are negligible.

5—Fuel and Labor Costs

A. Fuel Cost: On a heat unit basis, electricity is by far the most expensive source of heat. At a rate of 1½ cents per KWH, the cost is $4.40 per million B.T.U.

B. Labor: There is no labor necessary for utilizing electricity other than that involved in handling the materials being heated.

The second article in this series, "Manufactured and Natural Gas," will appear in October issue of American Gas Journal.

The Power of Ma ; Sentiment

THE course of the world has been dictated always by the compelling influence of mass thought. Take the big political and economical crises. We find preceding each, the growth of certain thoughts in the minds of individuals, followed by the exchange of ideas, with the result of a crystalization of mass sentiment, and only when the individual feels the beginning of the mass thought, do we find in him a desire to act—"to break down the old and establish the new."

It follows that the plain fundamental thought of "A Modern All Gas Home for Every Gas Man" that we advocated in our August issue, appears to have every semblance of a development from a single thought seed in the minds of a few individuals into a mass thought that will in turn influence individual action.

The enthusiastic reception to this thought by the Gas Man shows clearly that a trend toward mass sentiment on this important subject is on the way and would need very little urge to make it an actuality. It also shows that the Gas Man is always inclined to take a serious view of an existing ailment in his business and apply the remedy.

Naturally, this prompts our desire to play a part in the realization of this deal, and as a means to this great end, we are beginning with the Convention issue and continuing in subsequent ones a series of articles by Gas Men who believe in the use of gas to the practical extent of living in "A Modern All Gas Home."

It's Harvest Time—for Hustlers

By William H. Matlack

FALL; cool weather approaching; Young America again struggling with home-work or avoiding it. The katydids are shrilling their warning—"six weeks to frost." The home appliance merchant is sizing-up his quota sheets, hauling out his sales plans for final revision and in some cases trying to cover an eight months apathy and console himself with the fact that cool weather loosens purse strings and starts folks shopping.

Man feels the pull of the season and a desire to clean house and replace things that are out of style.

Fall brings the urge to do something in all people, especially those who throughout the year have held obstinately to the old ideas that folks do not have the money to buy during the early part of the year and that you can't expect to do much selling in summer.

Outlook Favorable

Fall is harvest time, and the fall of nineteen twenty-nine, having no presidential year to upset the equilibrium of man, should be a regular harvest season for the merchant who sells home labor saving appliances—if he will but use his native wit and work his plan.

Any fair-minded merchant with ten or even five years' experience in selling the American home manager must admit that never in the history of this business has the outlook for the progressive ones been more favorable. Never, for instance, has the gas man had such a variety of appliances to offer his customers, never has he had such attractive appliances. Never has he had such a volume of advertising to awaken interest in better home furnishings. Never before have "the powers that be" approached that state called "advertising consciousness" and been willing to invest in the future to the extent of setting-up a reasonable appropriation for the purpose of building proper display rooms, efficiently lighted and furnished for window display, direct mail, out-door and newspaper advertising. Never before has there been such a demand from the home manager for "the newest." Never before were there so many homes with women in them seeking appliances that will brighten these homes and lessen home labors. Never were there so many homes within reach of the distribution lines of utility company service. Never within the memory of man has there been such a desire to "keep-up with the Joneses."

William H. Matlack

Never in the history of merchandising has there been a greater opportunity for the seasoned salesman who will devote a definite portion of each work day face-to-face with prospects in the American homes.

At this writing, there is something startling happening every day in the home appliance industry. By the time this appears in print the range manufacturers will have told the industry of a half dozen or more new non-resisting appeals that the salesman may use to sell as many modern gas ranges, some of which have not as yet been exposed to public view. The fall line of gas ranges will be of astounding design, new in color combinations and embodying many features not yet a year old. Ovens and broilers insulated; compact, convenient heat regulators; automatic lighters for main top, oven and broilers; burners of new design; broiler innovations and convenient service drawers—plenty for the salesman to present to the progressive home manager.

Again, for the chap who is in earnest and wishes to sell happiness in home-work there are laundry appliances. Fall brings rains and flurries of snow; sell the woman a sure wash-day. A washing machine with its own gas water heater; a gas heated ironer and sixty feet of indoor clothes line, compact in a gas dryer that sterilizes as it harmlessly dries the sheerest fabrics. Fall brings the first desire for "a little heat," an opportunity to fill the countless empty fire places of the nation with radiant gas fires, an opportunity to sell the woman in the home added comfort and added beauty, "heat when and where you want it" with health giving rays.

Aside from these appliances there is the gas incinerator, the carefree gas water heater that enables the home manager to reach for a spigot instead of a match when hot water is needed for any purpose and the silent gas refrigerator which insures her an abundant supply of cold for keeping foods below the danger line of fifty degrees.

Every one of these appliances can be sold by the salesman who knows no seasons if he will but prepare himself and expose himself to plenty of prospective purchasers this fall.

Selling after all consists of preparation, presenting and persisting and constantly exposing merchandise to sales.

The manufacturers appreciate the value of preparing the market and are utilizing their knowledge by advertising their wares and thus paving the way for the progressives who will cash-in on their efforts this fall.

Having solved the problem of production the smart manufacturer is turning his attention to merchandising, advertising, displaying and coaching sales-people to sell his wares. This is true of all manufacturers, wholesalers, and retailers, sellers of staples and specialties from tonsil swabs to trousseaux.

Tuning In

These men are tuning in with the times, offering the prospective purchaser color, timely designs, and little-by-little plans of payment. "No down payment required of old customers" and "two years to pay" are some of the inducements offered the ambitious and expectant, who have the desire, and up to this writing, enough money to make the "small down payment," that will enable them to satisfy that desire.

The ambitious and expectant—the two who thrill and feel that the world grins as he writes "Mr. and Mrs." for the first time on the hotel register— market is a gigantic market and places a gigantic order each year for merchandise found on the sales floor of every progressive gas

company. This ambitious, expectant market looks forward to colorful kitchens, modern gas ranges, silent gas refrigeration, and all gas laundry, an incinerator and healthful, radiant gas fires for the home—if the appliance merchant exposes them to their view. The newly-weds and those sixty and under, wedded and coming into their own,—the "average Americans," those who wish to keep up with the Joneses,—are buying home appliances this fall from the persistent.

Just who is the ambitious, the expectant you may ask? The answer is easy. He is the man with the little car, who is buying his own home; reads the home newspaper, a popular magazine or two; talks about bootleg, yet buys nary-a-drop; who believes in the United States; who dabbles in the common stock of the corporation by which he is employed, paying for it on the little-by-little plan; who does not want to understand how to make money on margins; who contents himself most of the time by 'tending to the territory immediately under his hat; your neighbor; your brother in the luncheon club; the man on the street. Anywhere is he who composes the ambitious expectant market that seeks more and better home labor saving appliances. He is the man the manufacturer is preparing for the alert, enthusiastic appliance dealer and salesman who wishes to bring in a big harvest this fall and who will persist until he has done that thing.

Incinerator Essentials

The incinerator, as is the case with other appliances, must give complete satisfaction to the customer and require a minimum of servicing. It is important, therefore, to consider the essential features which must be embodied in an appliance of this character. They may be enumerated under the following headings.

1. Appearance which has an eye appeal and conveys the impression of ruggedness and quality.

2. Properly insulated to prevent excessive heat on the outside. A 90 deg. rise above room temperature is the allowable variation by the National Board of Fire Underwriters.

3. One-piece burner. This is insisted upon by the gas company laboratories, and the A.G.A. Testing Laboratory at Cleveland, as a protection against leakage.

4. Suitable observation door so that the burner may be seen at all times.

5. Interior sheets which come in contact with acids and gases to be heat and corrosion resistant.

6. Interior construction to be such as to permit of proper air circulation, and so there will be no blanketing of burned or unburned gases.

7. Ash pan which covers the entire area of the incinerator so no falling particles of garbage or ignited material will fall outside the pan.

8. It is essential that adequate flue conditions be available. Most of the trouble and annoyance with incinerator installations can be traced to poor flue conditions rather than to the incinerator.—*Louis Stotz, New York Regional Sales Conference.*

Cash-in on the Food Preservation Movement

Gas men should remember that the National Food Preservation program has awakened many of their customers to the value of keeping foods at a temperature below fifty degrees. Now is the time to push that doubting refrigerator prospect over the line, to get his signature. Point out the facts to him, the advisability of keeping food at proper temperature, the saving to be made by using the gas refrigerator, and the satisfaction to be had through its silence.

Silent as a Winter Night
The Gas Refrigerator
Ice from the heat of a small gas flame at little cost.
Thousands of users are enjoying the benefits of gas refrigeration service.
On display at all gas offices.
Any appliance may be purchased on convenient terms, completely connected if desired
Telephone: TRiangle 7500
The Brooklyn Union Gas Company

The whole nation has been told the story of refrigeration during the past twenty days and will be told again and again between now and October the first and therefore the job of selling refrigerators should be an easy one.

How It Is Done

Refrigograms recently told of a gas appliance salesman who made sales to the tune of $750,000 in 1928 and has set a quota for himself of $1,000,000 for 1929. Oh! sure they give the name and address.

After all, this man is doing nothing that any gas appliance salesman cannot do if he has the will, for he is working exactly along the lines recommended to salesmen of gas appliances fifteen or twenty years ago, and every year thereafter that we can remember. Build up a clientele and keep them sold by rendering them service, and you'll keep selling 'em.

Everybody who has ever pushed a door bell knows the story but a lot of them have failed to follow through.

Getting Them at the Start

We were talking to a young fellow the other day who had but recently been employed by a public service company as a salesman and who had decided upon a plan that looks like a good one. He said that after thinking over ways and means of securing customers and observing other men work he had decided to build-up a special file of brides-to-be and make a systematic effort to sell them.

This plan was to try to sell them a complete appointment; gas range, water heater, refrigerator, radiant heater, incinerator and dryer. He reasoned that his appeal would be, "well you are just starting out to manage a home and these appliances will help you do it in the most efficient manner possible. Also, you may as well get these things at the start and begin at once to conserve your time, health and happiness."

We would say his line of reasoning is good and that he is going to develop the proper market. Statistics show that 1,250,000 brides begin to manage new homes each twelve months. Young home managers are receptive to new ideas and properly cultivated will be steady customers for what have you for a number of years to come.

How to Get Them Out

A wide-awake retailer of gas ranges in the middle west is insuring a full attendance at his demonstrations by arranging with women's clubs to attend his demonstration in a body. For a party of fifteen or more members of selected organizations he offers to donate five dollars in cash to the organization to do with as they see fit. This dealer so we have been informed has arranged for three demonstrations a week for as many as three months in advance all during the year. It has also been said that so far a sale has been made at each demonstration and each one has also produced several live prospects.

The Public Service Company of Northern Illinois uses a plan somewhat along the same lines to introduce home laundry appliances.

Try This One

Now that gas appliance merchandisers have adopted the special one day sale idea and made a creditable job of it, it

seems it might be fitting to extend the idea. As a suggestion, why not a "Monday Special sale," say once every three or four months? Why not have a "Saturday Special" on some of the smaller appliances once in a while? There is no reason why such one day sales plans cannot be worked out and made profitable. Talk to any gas man and he will tell you that to boost sales one must devise new ways to attract new faces into his store. The special one day sale may help to solve this problem.

As we view it the gas company operating an appliance store in the cities having populations ranging from ten to one hundred thousand might do well to try a "Saturday Special." In cities of this size a great many folks do the bulk of their shopping on Saturday and so far as we can learn the gas man has not cashed in on this day as he should. The reason may be that folks have not been properly attracted to his store on that day. Fall months should be an ideal time to test the idea. Try it.

How to Attract Them

One way to get more people into the gas company store is to have more merchandise to attract them. There are a number of small appliances that may be used to attract folks into the store and there are any number of related items that might be used.

Some of the far-sighted gas merchandisers are offering their customers aluminum ware, percolators, double boilers, triple sauce pans etc. These appliances are featured on open display tables and are attractively priced as specials for cash-and-carry customers. Other companies use fewer appliances and feature them by store demonstrations on "discount days." At these demonstrations recipes are also distributed to all comers and it is said in both cases that more and more people are visiting the stores.

Reversing the Usual

The merchandise manager of a department store tells us that whenever any of the buyers of household appliances are unfortunate enough to select an item of merchandise that does not move fast enough to secure the desired turn-over he moves it, not by cutting the price to the bone, but by placing a bonus on it. This bonus brings the desired results.

He also said that such items often speed up the sale of other items being shown. He attributes this to the fact that being attracted to the item by a special sales talk the customer just naturally looks about for other needed items.

A Clean-Cut Dryer Ad

What seems to us to be an outstanding gas dryer advertisement is one used by the Laclede Gas Light Company. This advertisement tells the whole story of drying clothes in a very forceful manner and should furnish some very good ideas for the ad-man whose job it will be to prepare some dryer advertising this fall. As we study it we find sufficient idea provoking material to write a series of advertisements around—reasons why the home manager will want a gas heated laundry dryer.

SOLVE WASHDAY'S BIGGEST PROBLEM

What a Gas Laundry Dryer Does

Makes washday independent of the weather. Clothes may be washed, dried and ironed in the same room on the same day.

Conserves space by drying all the clothes in a cabinet which occupies but 10 square feet of storage space yet has a capacity equal to 40 feet of clothes line.

Dries lightweight pieces in 15 or 20 minutes. Heavier pieces in proportion.

Sterilizes. By allowing garments to hang to dryer 20 minutes after drying all germs are positively destroyed.

Prevents clothes from rust, smoke, dust, germs and fading caused by sunlight.

Saves water and time on clothes—preserving them from whipping winds and gripping pins.

Washers and ironers have done much to remove the drudgery of washday but they make no provision for drying.....and this is washday's biggest problem.

The modern homemaker in solving this problem with a Gas Laundry Dryer, an efficient dryer that saves at least 50% of the time required for the laundry process and eliminates the labor of lugging wet clothes from the washer to the line.

An automatic system of natural circulation distributes the warmed air evenly to all parts of the drying cabinet. This, coupled with thermostatic heat control, prevents scorching and discoloration.

Special Offer to Home Owners

So enthusiastic are we over this dryer that we are making a special offer to home owners. We will install the dryer for a 10 day free trial. You use it as much as you wish. At the end of 10 days if you wish to keep it you make the first of 12 easy monthly payments. If you don't want the dryer we'll remove it and you don't owe us a cent. That's fair enough, isn't it?

MAIL TODAY!

The LACLEDE Gas Light Company

OLIVE AT ELEVENTH

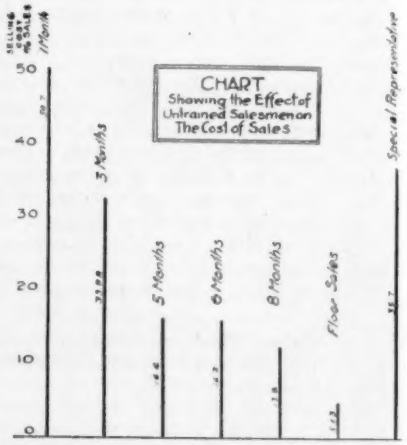
Poster Advertising

Poster advertising, such as has been used by the Consolidated Gas Company New York, The Spokane Gas Company, The People Gas Light and Coke Company and several others, has jumped the gas industry ahead several years and placed it in the company with other advertisers who had to do their selling quickly. Study poster advertising as you speed over the highways and see what you can do to advertise gas.

Cost of Training Salesmen

That it costs a great deal to train salesmen to sell home appliances there can be no doubt. The biggest cost however, is the turnover of men. Just what these costs are we are unable to say. We have heard a great deal of guessing, some stated in dollars per man and others in per cent of sales, but that does not mean anything. However, we have found a man who has been giving the matter some study and who has charted costs over a period of eight months.

This man's findings indicate that an untrained man's costs amounted to 50.7% for the first month of his employment, 33.88% at the end of three months, 16.6% at the end of five months 16.2% at the end of six months and 13.6% at the end of eight months. He also explained that this was considered by him to be a reasonable cost and that while there were men who could operate for less that he was of the opinion that sueh a cost was reasonable. This man also found that a specialty man operating over the same period ran his costs up to 35.7%. Aside from this he found that floor sales during the same period averaged 5.63%.



These costs in all instances cover drawing account, commission and possibly a special bonus. As we view it these costs are not excessive in view of the high turn-over that there usualy is in men selling home appliances.

The Plan's the Thing

The plan's the thing; it naturally being assumed that the product has merit, and therefore worth merchandising. The plan's the thing when it is properly built up and followed through.

Obviously, the way to sell the new load building appliances is to build a selling plan around them and push the plan through step by step, as laid out in the plan book until the word "finish" is reached.

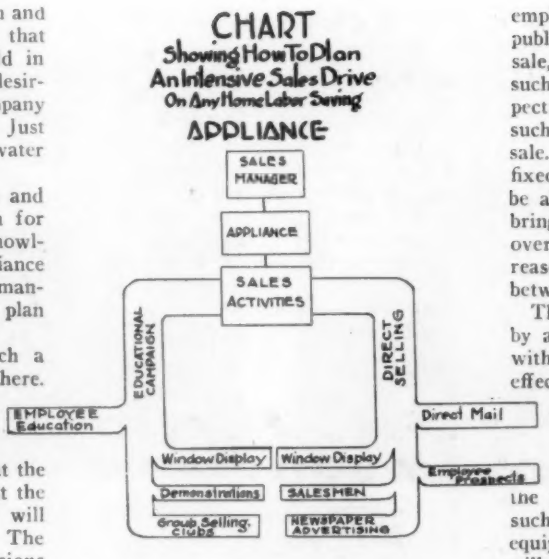
In selling, let us say gas heated clothes dryers, for that is an ideal appliance to offer the home manager in September, it naturally follows that the sales manager should be thoroughly acquainted with the product. Assuming that he is, then let us see what some of the other steps are that go to make up a plan to market the dryer.

The development of indoor drying of clothes with gas presents no greater marketing obstacles today than the gas range as an appliance for cooking did only a few short years ago. However, its general use in the American home does produce a marketing problem and a big one. The appliance itself has passed the

experimental stage. Most all gas man and thousands of home managers know that "it works" perfectly. It can be sold in greater quantities and it is a most desirable load builder for the gas company and a needed appliance in the home. Just the same, like continuous flow water heaters and ranges *it must be sold.*

Notwithstanding all that has been and is being said about the "competition for the customer's dollar" a complete knowledge of this or any other gas appliance and what it will do for the home manager together with a complete selling plan will sell it.

As a suggestion for building such a plan we offer the diagram shown here. As will be noted, first consideration is given to the "sales manager" and the second to the "appliance." It must be assumed, as stated above, that the appliance is an approved one and that the sales manager is convinced that it will be of service to his customers. The story that follows these two subdivisions of the plan may be tersely stated thus: Mr. Salesmanager selects a dryer that he has implicit faith in, one that he would sell to his best friend (and install in his own home) and feel that he was doing him a real service. This is the big job. the other activities follow along smoothly as a rule.



To educate the employees in your organization (chart left branch) is the first step. Teach them all there is to know about the dryer and what it will do for the home manager. When they have this knowledge they are ready to sell. The next step, then, is to acquaint the public with the appliance. Build a timely window display, hold store demonstrations and arrange to sell the idea of indoor gas drying of clothes to women's clubs. These are educational works that must be carried on immediately after the employees of the organization have been educated. As this work is in progress the outside and floor sales people may turn to active selling.

Under the head of direct selling again comes window display, direct mail, employee's prospects, salesmen and newspaper advertising—window display to arouse general interest along with direct mail and newspaper advertising to develop prospects for the trained salesmen to visit and sell.

In planning the newspaper advertisements build up a budget based on estimated sales, allowing a reasonable amount for each dryer sold. This done a schedule may be arranged that will permit advertisements to be run throughout the sale. This schedule would use the largest advertisements first, at the time the appliance was being introduced and then follow with the smaller advertisements until the sale is closed. In introducing an appliance by a sale of this kind it frequently happens that the newspaper will give it a "reader" at the time the first advertisement is published. In submitting such readers endeavor to make them newsy, tell of some special feature in connection with the appliance and what it will do for the home managers. Items of news go over much better than "readers" that simply state that the gas company is having a sale of such and such an appliance. Use a theme that will permit the editor to write a lively head for the "reader;" something on this order; "Women May Dry Clothes in a Downpour of Rain," or some other such interesting head-line. In other words sell the newspaper man on the value of your merchandise and leave the story to his telling.

In the use of direct mail it is always more profitable to use a hand-picked list, but, if you wish to introduce the appliance to all domestic customers the mailing may be made to cover at least sixty per cent of the domestic customers. A general mailing, however, loses much of its effect, for the simple reason that it cannot be followed up quickly enough. In sending out such material our recommendation would be not to send it out hit or miss, but to have each salesman build up a list of prospective customers in his district and let him be responsible for mailing the literature and following it up. It is conceded by old campaigners that this is the most productive way to use direct mail. However, a great many utility men find that a bill flyer to all residential customers is effective. In using flyers be certain that they are attached to the bill, not merely inserted in the envelope carrying the bill.

Window displays should be well thought out and one should try to get over the idea that no matter how hard it rains the clothes may be dried, if the home is equipped with a gas dryer. Not long ago we saw a dryer display that was built along such lines. The dryer occupied the center of the window and wing walls of bright velour paper with pastel drawings representing a rain storm on either side of it put the story over in good fashion.

Where it is possible to educate all other employees who come in contact with the public, regarding the appliance and the sale, it will be found advantageous to pay such employees a fixed sum for each prospect turned in where a sale is made to such prospects during the period of the sale. In addition there might be paid a fixed amount for any sales that they may be able to make direct. This plan often brings to light latent sales ability, Moreover, it is well worth employing for the reason that it builds up a better feeling between the sales and other departments.

The educational plan may be put over by a general meeting or special meetings with the salesmen but one of the most effective ways to have the lesson learned is to build up a boiled-down sales talk and distribute it to all concerned. This talk should bring out the sales features of the appliance, the plan of selling and the reasons why such an appliance should be a part of the equipment of every home. In fact as you will gather from what has gone before, it would seem that the most effective way to put over the sale of any appliance is to work out a definite plan and put it into a plan book for every person who is to have anything to do with the sale. This book should contain copies of advertising material to be used, cuts of the appliance to be feautred, prices and terms, date the sale is to open and date on which it is to close, a statement from the sales manager regarding the appliance and his reason for staging the sale. If such a plan is built and followed through sales will be made, for the plan's the thing—if it is followed through.

Plan to Attend the A.G.A. Convention

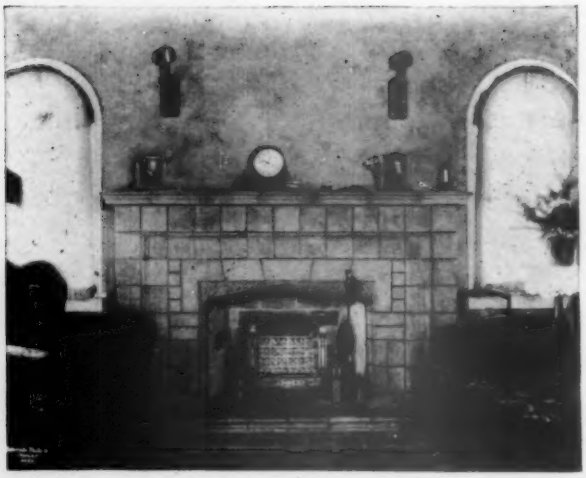
Don't Neglect the Gas Range

The back-bone of the domestic load is the gas range and notwithstanding any effort that is being made to sell the many other needed home appliances the gas range should be constantly featured. This does not mean that a "sale" should always be in progress but that the range should be continuously and consistently merchandised. Demonstrations, both in the store and the homes, should be conducted all the while and a number of new tested recipes should be distributed to the home manager at frequent intervals. Every means possible should be employed to induce folks to do more home cooking.

Show the Customer

The dramatist sells his play by creating atmosphere through light and music and stage setting and this, it seems, would be the way to sell the advantages, the beauty, and convenience of radiant gas fires this fall.

Merely setting these heaters around on



Typical examples of fire-place settings in gas company display rooms which attract prospects

the sales-floor in no way suggests their true usefulness or how greatly such appliances enhance the beauty of the home by filling an empty fireplace.

Many of the newer gas company sales rooms have provisions, in the way of fire places built in, to display radiant gas heaters while still others occupying older buildings are using "built-up" fire places for this purpose. In this respect it would appear that such displays might be further enhanced if they were set in a studied atmosphere, a natural home-like setting.

To furnish an idea of how this might be arranged study the photographs reproduced here, any of which might be used for a model. The fireplace might be inserted in any wall by building in a false wall of composition board over which a coat of plastic material might be applied and painted the same color as the permanent wall, while the vent for the gas fire might be either carried out through the sides of the built-in display or to the outside atmosphere.

Showing folks helps materially in selling appliances of any type and setting them in the proper surroundings too, often aids in the selling process.

A New Use for Gas

A new use for gas, The Better Fuel, has been found. This time it was used in a New England clambake. Like most of the uses for gas, this new one was born of the necessity for a clean, smokeless, odorless fuel.

About sixty members of the Distribution Department of the Fall River Gas Works Company, Fall River, Mass., recently planned a clambake to be prepared on the company property at the Distribution plant. Due to the proximity of adjacent buildings, and the fire hazard and smoke nuisance incidental to the use of a wood fire for heating the stones, the management suggested that gas be used as the fuel for the bake. It was pointed out that not only would the objections be overcome but that a better bake should result from the use of this superior fuel.

Accordingly, a suitable burner was designed and made by members of the Distribution Department and the bake was held as planned. The results were even better than expected. The stones were thoroughly and evenly heated, the ingredients of the bake were deliciously cooked, the time required for preparing the bake was considerably reduced, and the gas consumed was very low, only about 700 cubic feet, costing at the Fall River rate only about 80c.

Further advantages of the use of gas for this purpose were found to be the entire absence of smoke odor in the food, something very difficult to avoid when wood is used for heating the stones, and a much greater cleanliness in the cooking of the food due to the elimination of soot and ashes.

There are not many opportunities for securing additional load through the use of such equipment, perhaps, but the incident serves as another example of the superiority of gas for practically every process that requires heat.

Good Work

"Betty dear, tune-in station QUZ; I am at loss to know just what to have for dinner tonight." So, in effect, will become the habit of the home manager over the entire country again this fall. The convenience and economy of gas and gas cooking is interesting "air-information" and a number of gas companies and gas appliance manufacturers are taking full advantage of the fact.

Roper of Rockford for instance did a creditable broadcasting job last year as did the Peoples Gas, The Laclade Gas Light and The Consolidated Gas Company, New York. Thirty-five thousand women, the home managers from all points of the compass, responded direct, by letter, to the Roper Programs over the N. B. C. system while countless thousands more eagerly awaited their and other programs broadcast daily.

Broadcasting recipes and cooking hints helps mightily in boosting the cooking load and it's good news to learn that many concerns will be on the air with recipes during the fall and winter months.

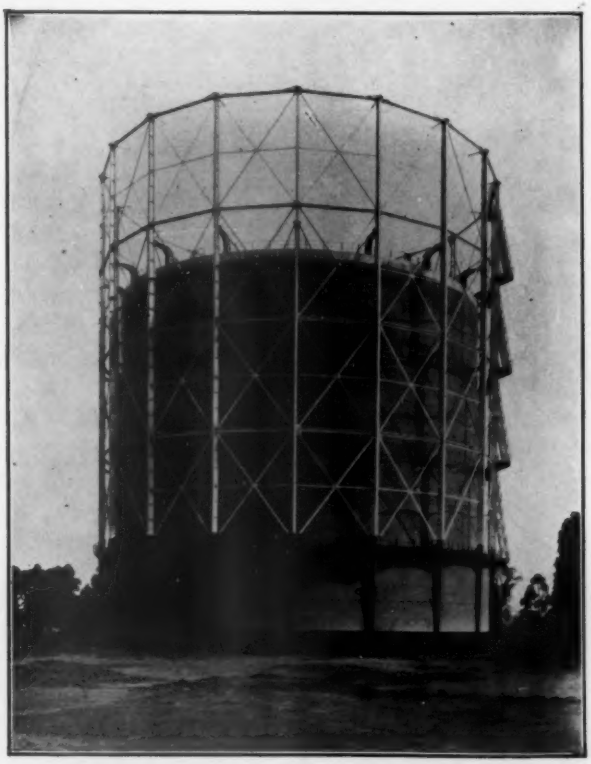
Thousands Attracted by Electrolux Display in Atlantic City

Thousands of visitors to Atlantic City were attracted by a special Electrolux Gas Refrigerator window, shown in the Du Pont permanent display on the boardwalk, the week of August 5th. Du Pont products are used in finishing the Electrolux. According to the manager of the display, the biggest crowd of the season was present the week of August 5th, and vast numbers stopped to examine the refrigerator that makes ice by means of a gas flame.

ENGINEERS *and* BUILDERS GAS HOLDERS *and* TANKS

GAS HOLDERS
PURIFIERS
SCRUBBERS
CONDENSERS
STEEL TANKS

The activities of Stacey Bros. Gas Construction Co., are not limited by the confines of this country alone, but extend to distant lands as well; as witness this monument to our "Ability to Serve" erected in far away Brazil.



2,000,000 cubic foot holder erected at Sao Paulo, Brazil, by Stacey Brothers Gas Construction Company

STACEY BULLET
PENSTOCKS
PLATE FABRICATION
STACKS
STAND PIPES

The same preciseness in erection, the same materials and workmanship that characterize every structure designed, fabricated and constructed by us, went into this holder. We cannot afford to jeopardize our well earned reputation for

ABILITY TO SERVE

ABILITY TO SERVE

The STACEY BROTHERS Gas Construction Co.

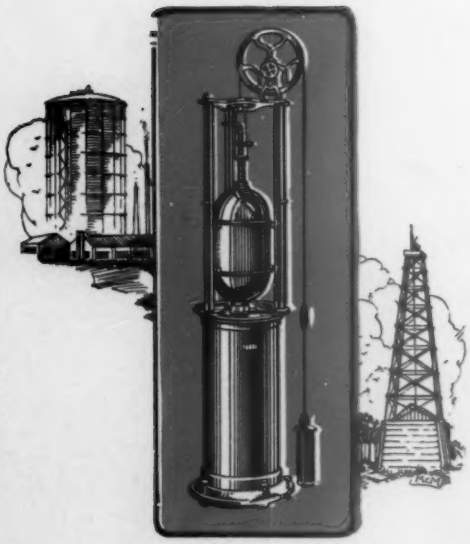
CINCINNATI, OHIO

JAMES E. STACEY, Pres. ANDREW J. STACEY, Vice-Pres. WAYNE STACEY, Gen. Sales Mgr.
ARTHUR A. POPE, Sec. and Treas. WILLIAM A. MILLER, Chief Eng. P. C. RODGERS, Asst. Sales Mgr.

NEW YORK OFFICE—75 West Street—P. F. McEnaney, Mgr. Tel. Bowling Green 8186

New England Representative—Eastern Service Co., Boston.

KNOWN FACTORS CUBIC FEET IN METER VALUE



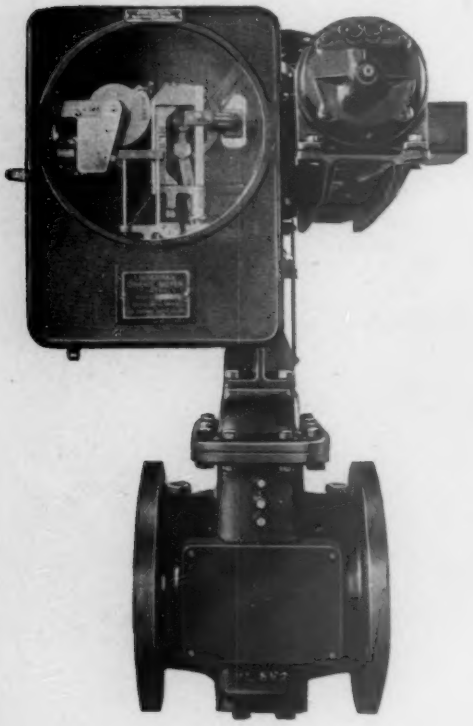
The Higher Standard

In Gas Meters, enduring accuracy, quality construction and time-tested improvements are the essence of value.

There can be no economic justification for "good enough" or experimentation in the volume buying of such important long-term equipment.

For that reason, the vast majority of Gas Companies are guided solely by considerations of *true economy* in the purchase of Gas Meters.

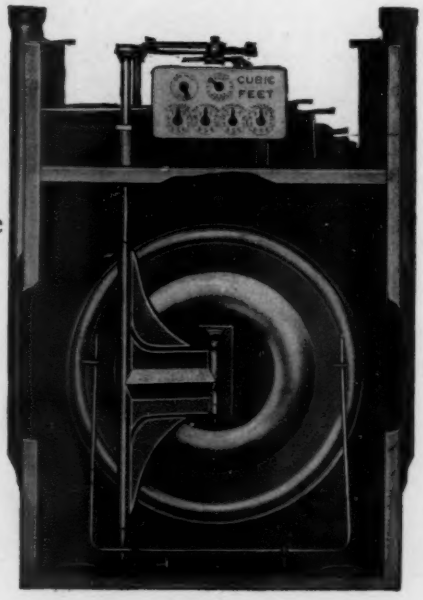
LARGE VOLUME MEASUREMENT
LINDERMAN METERS



AMERICAN METER COMPANY
JOHN J. GRIFFIN & COMPANY
HELME & McILHENNY
MARYLAND METER WORKS
D. McDONALD & COMPANY
METRIC METAL WORKS
NATHANIEL TUFTS METER WORKS
PACIFIC METER WORKS

AMERICAN METER CO. MEASUREMENT ENGINEERS

A-TYPE METERS
Tinned Steel Case



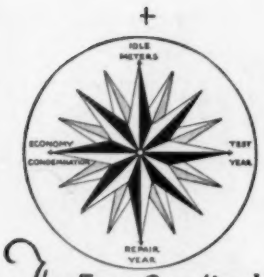
KNOWN FACTORS CUBIC FEET IN METER VALUE

In Meter Equipment

American Meter Company Gas Meters are unsurpassed in all the advantages that make for *true economy:*

Up-to-date quality, ample capacity, and an unmatched record for accurate and reliable performance, distinguish every type and model.

Long experience, nation-wide service facilities, manufacturing integrity—in fact all the qualifications that have brought world leadership in Gas Measurement Engineering—distinguish the manufacturer.



The Four Cardinal Points—a guide to effective Meter Maintenance or larger returns on Meter Investment

AMERICAN METER COMPANY

INCORPORATED

The World's Largest Manufacturers of Gas Meters and Allied Apparatus

ESTABLISHED 1836

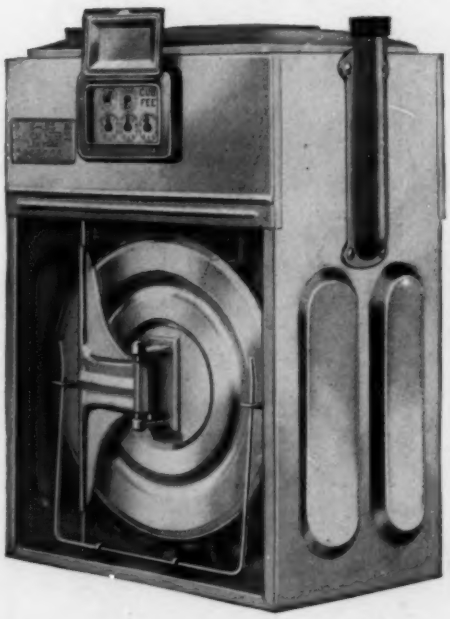
General Offices: 105 West 40th Street, New York City

IRON CASE METERS

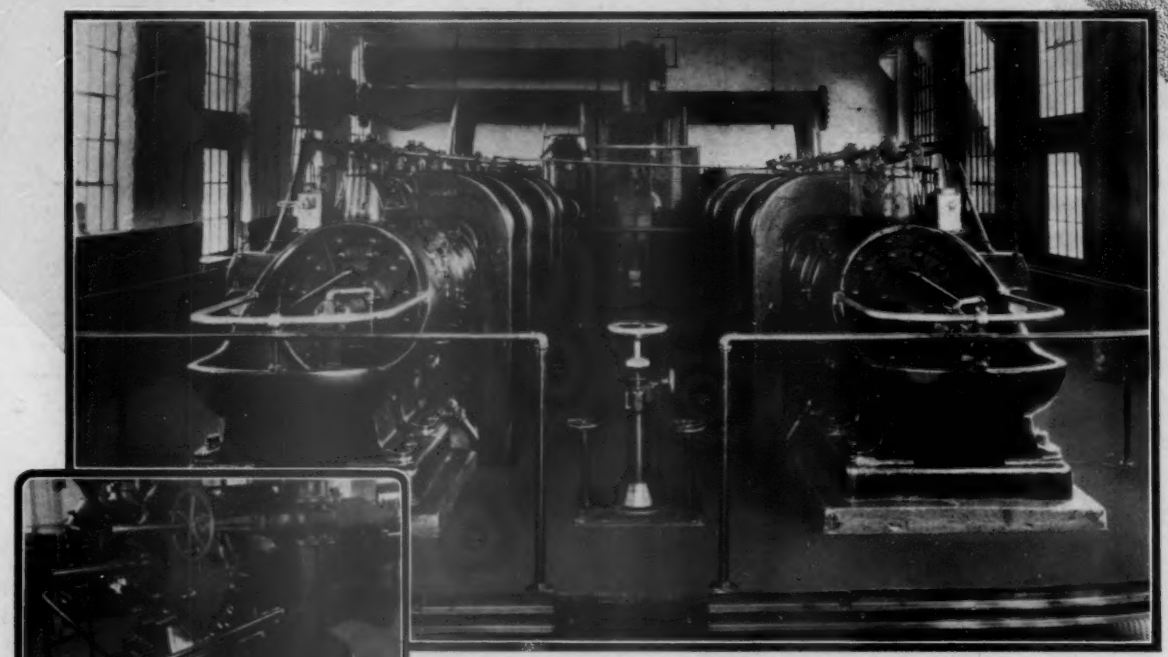
For Low, Medium, and High Pressures

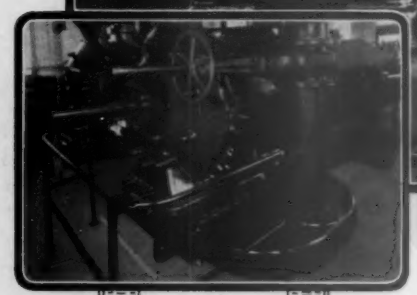
B-TYPE METERS

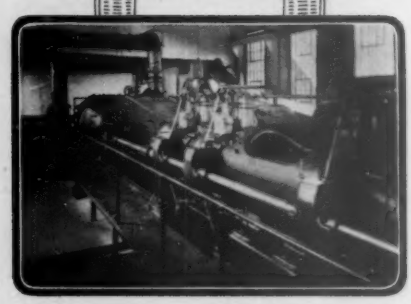
Tinned Steel Case



COOPER
GAS ENGINES INSURE UNINTERRUPTED SERVICE







A 760 B. H. P. four-cycle Cooper Gas Engine direct-driving positive displacement compressors in the West Conshohocken Plant of the Philadelphia Suburban Countries Gas and Electric Company.

COOPER Gas Engine Compressors, in the manufactured gas industry, have been considered mostly for high pressure transmission where the load factor is low. The Cooper in the above installation, however, stands as a reserve unit to the electric motors. Should the current fail because of a thunderstorm or other emergency condition, the Cooper Engine is started instantly and the proper supply of gas to the distribution system is thus maintained.

Natural gas men everywhere know from experience that there is no way to get as much horsepower out of each cubic foot of gas as to burn it in a Cooper Engine. Cooper's low cost operation, accessibility and unfailing performance are now winning the consideration of manufactured gas men. *Write for test facts and figures.*

THE COOPER-BESSEMER CORPORATION

Formerly The C. & G. Cooper Company and The Bessemer Gas Engine Company

MOUNT VERNON, OHIO GROVE CITY, PA.

Branches in all principal cities

A Cooperative Campaign With Dealers

By Jack Wooten

A FREE gas piping offer made by the Broad River Power Company of Columbia, S. C. during the fore part of the year gave gas merchandise dealers an opportunity to enjoy the best month they have had in many moons.

The Gas Company, which is at present pushing gas service and leaving the merchandising end of the business up to the dealers to follow through, reports that some 60 persons who have never used gas before were added to the system as a result of the campaign. In addition to the new customers 66 ranges, 66 water heaters and 12 room heaters were purchased during the month.

Cooperation is absolutely necessary for the success of a proposition of this nature, and this point was stressed by the company at the beginning of the campaign. Manufacturers, dealers and some of the Columbia plumbers assisted in the movement.

Other Factors Considered

The Broad River Power Company was naturally primarily interested in increasing its load, but there were other factors to be considered, chief of which was the installation of standard gas appliances.

Just before the campaign started the Gas Company sent out letters to dealers and plumbers, acquainting them with the proposition, and furnishing them with a list of customers on the gas lines who were not using gas. A list of present gas customers who were in the market for additional appliances was also furnished the merchandisers.

On the opening morning of the campaign, the Gas Company presented the rules of the free offer to prospects by means of a large advertisement in the newspapers. The provisions were as follows:—

1. That the free piping offer applied to both old and new customers.

2. That free piping would be given as follows—service line not to exceed 100 feet and all other piping to each person installing additional gas equipment during February.

3. That each house in which new customers lived must be located on the Company's gas mains and occupied by somebody for a period of at least six months.

4. That the customer (either present or prospective) would agree to install standard appliances approved by the American Gas Association. Ranges had to be only those bearing the Blue Star label of the association. Automatic storage or Instantaneous had to have an approved pilot control also.

Some of the gas appliance dealers tied up with the Broad River Power Company's newspaper advertising, and afterwards posted the ads on their windows. The Gas Company put in a very neat and conservative display, and several of the dealers did likewise. Windows cards were furnished by some of the manufacturers and these were displayed. Banners were suspended from the Company's and dealer's automobiles and trucks. The campaign was well advertised.

Advertising in itself is very fine business, but is far from effective unless it is followed up. But the Broad River Power Company and the standard appliance merchants saw their proposition through by personal solicitation of the prospects.

The Gas company had no merchandise to offer, but they did have service to sell. Accordingly, it set out to reveal this fact to prospective customers. Solicitors were sent out from the office to every street in Columbia where the gas mains were in existence. Every house on every street was approached, and free piping offer was outlined in detail. While the solicitor was telling his story, he threw in some suggestions on the use, convenience, economy and dependability of gas. If the one interviewed appeared to be interested in the proposition, the Gas Company employee took the name and the particular appliance the prospect was interested in. This information was next turned over to the dealers and they sent their salesmen out to follow up the "tip".

The Gas Company maintained an information desk at its main office. Here one employee was stationed to answer any question relative to the campaign, and here a number of prospects were obtained. An experienced salesman was also employed by the Company to assist the dealers in selling the prospect. No favoritism was shown any of the dealers. Each was given an equal chance to call at the Gas Company's office and get a list of prospects day by day.

The results of the free piping offer were far more beneficial than were indicated by the actual figures shown on the Company's books at the expiration of the campaign. In the first place, a permanent record of definite prospects was made possible by the campaign. Scarcely any houses were skipped in the canvass for new customers. The solicitors, through personal interviews, were able to ascertain just how interested the non-gas consumers were in gas service and gas appliances.

Gas Service Advertised

The canvass also had a tendency to advertise gas service—to set prospects talking about gas. The solicitor had an opportunity to get the stupid idea of gas as a dangerous explosive out of the prospects' heads.

The dealers were also benefitted in so far as records go. They, too, derived the benefit of the publicity given to gas.

And so, instead of March, 1929, ending the campaign, it merely got it started. There is in the Broad River Power Company's office now a card system showing what might be called definite prospects. The cards indicate who really desired gas service, with notations as to why the prospect has not brought the service into the home, and when she expects to have it installed. In the file is information on every new customer that was brought on the system during the campaign. If Mrs. Brown purchased a gas range, then maybe later she will be interested in a water heater when winter comes. And so on. Another campaign of a very different nature might be just around the corner. When its time comes the Gas Company has a pretty good idea as to who shall be solicited for future services.

TRY THIS IN YOUR KITCHEN

Jones had this photograph taken and published in advertising for a cook—He turned away five hundred applicants.

Courtesy, Greater Service News

The Dixie Gas and Fuel Company Increases Volume By Selling The Man

By Chas. N. Tunnell

Mr. Briggs, Merchandise Manager, Dixie Gas & Fuel Company, believes in selling the man

IT is generally conceded by gas appliance dealers and salesmen that merchandise must be first sold to the woman; and the Dixie Gas and Fuel Company of Beaumont, Texas works to sell the woman modern gas appliances. But W. R. Briggs, merchandise manager for this firm, finds that, after all, the man controls the purse strings to a large extent and that selling the man of the house has increased merchandise sales for his firm.

"Often times a salesman has what he considers a fine prospect for a range or other appliance. When he fails to make the sale, he is stumped, wondering why he failed after feeling convinced that the woman of the house was sold. Eight out of ten times such sales are missed because the woman has tried to sell her husband and failed. The average salesman thinks he should line up the woman of the house to sell her husband on that new gas range; but the average woman is a poor salesman," Mr. Briggs explains.

He says farther, "It's true that the woman of the house should be sold and her cooperation is needed to close the sale with her husband, but we find that more sales are actually closed by diplomatically keeping the woman from approaching her husband on the question of a new stove or similar appliance until the salesman is there to assist in the closing of the sale. Naturally, the woman wants to help in many instances; and it takes some diplomacy to keep her quiet until the logical time. She often suggests that she will talk with her husband about the matter, but our boys find that she knows but few of the merits of such an article; and her husband is too often convinced that such a purchase is just to satisfy another fancy or whim of his wife and not one to be considered seriously.

"But of course, the woman can not be made angry or made to think she is a poor salesman, for even if she is a poor salesman in selling, she can certainly block any sales effort of the salesman. Our boys handle the woman by some such suggestion 'Now Mrs. Smith, I sure want you to help me sell your husband one of these new ranges; but we don't want him to think we have been framing up on him. Let's don't mention it to him until we both have him together; then I'll show in detail just why this stove is the one you need; then unsuspected like, you can join in and help me sell him.'

"And in this way, our boys get the cooperation of the woman in selling her husband, but they keep her away from the subject until the salesman is on hand to demonstrate or explain the article to its best advantage."

Selling the gas range or gas appliance in the prospect's own home around the family circle is a policy that has made this department successful with the Dixie Gas and Fuel Company of Beaumont. After having found his prospect in the woman, the salesman makes arrangements to call back in the evening when her husband is at home. In most instances, the second approach is made and directed at the husband, his never knowing that his wife has already talked the matter over with the appliance salesman. At this time, the head of the family is in proper surroundings and away from business to talk home comforts and conveniences.

And it's this night work that gets volume for this firm. Briggs has shown his outside salesmen where there is often another advantage in calling at night. Many times the woman would not give her consent to helping sell her husband or for the salesman to call back, but when calling at night, both wife and husband are together; and in many instances, it is the man that sets his eye on a new stove or takes pride in selecting something to make his wife's home work and surroundings more pleasant.

A concrete example of the value of doing some sales work at night was demonstrated by Mr. Briggs. He had been stressing a little night work to his boys, and showing them by actual results that he, too, could get out and make sales after supper that could not be made in any other way. He happened to see a furniture truck unload some new linoleum in front of a house whose owner he knew slightly, but not intimately.

That night when he called, it was, "Mr. ——, I see you have been buying some of that new linoleum in new colors. I would like to see it."

Of course Mr. Briggs gained an entrance into the home, the man being pleased to show the new linoleum. He was farther pleased at Mr. Briggs' remarks about his thoughtfulness in making an attractive colorful kitchen for his wife.

And when Mr. Briggs mentioned that he ought to have a new range in a color to harmonize with the rest of the kitchen color scheme the man of the house was instantly interested.

The Idea Put Over

As a result, Mr. Briggs sold this customer on the idea that there was real pride to be had in having a pretty kitchen with its modern conveniences. The customer slept on the subject; then when Mr. Briggs called by telephone the following morning the prospect answered, "Yes, Mr. Briggs, I've decided to buy that new stove. I know our old one is plenty good from a service standpoint, but if a new $150 range in a color to match her kitchen will make the wife's work more pleasant, she shall surely have it. And say, I wish you could get the installation made today or tomorrow, we are both anxious to see it working."

The sale described is just one of the many made by Mr. Briggs and his four salesmen by putting in a little sales effort at night. The result of calling after supper is shown by figures kept on the record of one salesman for this firm, a new salesman incidentally. This man carried out Mr. Briggs' suggestion of doing some tap tapping on doors after supper. As a consequence, he exceeded his sales quota the first month of his evening work by seven hundred dollars and exceeded his sales quota the first half of the next month by six hundred and fifty dollars.

Another advantage that Mr. Briggs finds in selling the man instead of clos-

ing the sale with the woman is that of raising the amount of the sale. Many times a woman customer will decide on a fifty dollar range just because her husband has suggested that she pay no more, but as a matter of fact, she wants a seventy-five dollar stove. Mr. Briggs instructs his men not to be too anxious to close such sales. His men wait to see the husband. In most instances the higher price stove is sold; the woman is better pleased; the man is just as well pleased; and the salesman has increased his sale by fifty per cent.

There are four salesmen for the Dixie Gas and Fuel Company and there is no special floor salesman. Each salesman takes a turn about spending every fourth day on the floor. Commission percentages are smaller in this way but the total earnings of salesmen are greater, each salesman getting credit for all sales from his territory. This plan has eliminated a floor salesman, the other four men splitting an average of three hundred dollars monthly formerly paid to him, but volume sales for the firm have been increased.

A Big Advantage

One big advantage of the salesmen working on the floor every fourth day is that of giving concrete demonstrations to prospects gained out in the field. It is a bit hard to convince some women of the attraction that a new colored range will give her kitchen but it is seldom difficult to get the undecided prospect to come to the office on a specified day to actually see the new colored stoves in suitable surroundings. The salesmen make these appointments for the days that they will be on the floor.

Then to make demonstration convenient and to give the merchandise a home-like setting, four attractive kitchenettes have been built in this sales room, each kitchenette finished in different color scheme to harmonize with a colored range. These booths make it easy for the woman to select a color scheme for her own kitchen.

An old stove allowance and a premium of dishes or similar articles are used for special sales by this firm instead of any price reduction. Mr. Briggs says, "It's no inducement during a special sales to tell a woman that she is getting ten percent off. The fifteen dollars difference on a one hundred and fifty dollar stove does not mean anything to her, but a five dollar and seventy-five cent set of dishes is a big item and brings a lot of sales."

Another thing practiced in this firm is that of charging conservative mark-ups on specials and appliances specially ordered. Recently, Mr. Briggs imported a fireplace fender from France for a customer. It was pointed out to him that the fender could carry a three hundred percent mark-up; but he sold it at a thirty percent gross profit. A friend was made and this same customer recently built a "better-type" apartment house. For this Mr. Briggs sold him eighteen ranges at two hundred dollars each, clearing fifteen hundred dollars on these appliances. And now this customer is building an individual home in which there will be five thousand dollars worth of gas appliances.

The Dixie Gas and Fuel Company of Beaumont, Texas is selling six heavy carloads of gas ranges annually as well as a corresponding volume of other appliances. The fact that their salesmen are working on a policy of selling the man of the house and making many calls in the evening after other salesmen call it a day is largely responsible for this substantial business. And as this policy is especially being carried out this year, merchandise sales for the first half of 1929 are showing an eighteen percent increase over sales for the same period of 1928.

A Gas Cock Testing Machine

IT MIGHT be of interest to dealers and others interested in the sale and use of gas appliances to know something of the manner in which gas cocks can be tested.

The gas cock is one of the most important parts of a range. The composition of the brass used in the manufacturing of cocks and the workmanship must be such that, after years of usage, they will still be gas-tight. If the workmanship is poor, leaks will develop. If the lubricant is improper, the cock will bind, or stick, after a few years of use.

Fig. 1—Installing gas cock on testing machine to determine value of a special grease

On some appliances, the gas cocks become quite hot from the heat of the burner. Proper lubrication is necessary, therefore, to keep the cocks from binding under any condition that they may be used.

In order to be assured that the gas cocks manufactured by the American Stove Company are properly designed and will last as long as the appliance itself, Mr. M. A. Possons, Manager of the New Process Stove Company Division, designed and built two special testing machines for this purpose.

One of these machines is in use at the factories of the New Process Stove Company, a Division of the American Stove Company, where the gas cocks for the Red Wheel gas ranges are manufactured. The other machine is used at the Research Laboratory of the American Stove Company.

Fig. 2—Gas cock on testing machine being operated inside the oven to learn effect of heat

The machine is shown in Fig. 1. The mechanism is very simple, the actuating force being supplied by a small motor. The motor is connected to a reduction gear, which, by means of an eccentric, turns a shaft back and forth about fifty times a minute through an angle of 90 degrees. There is a counting device which records the number of times the gas cock is turned "on" and "off."

The cock to be tested is clamped to the frame of the machine. The key, or movable part of the cook, is bolted to the shaft. Thus, a cock on this machine will be turned "on" and "off" about fifty times a minute and will receive as much usage in an hour as it would normally get over a period of about three years on the average gas range.

As was stated before, to give satisfactory service, a gas cock lubricant must retain its lubricating quality at all temperatures to which it may be subjected. If the lubricant fails, the cock binds, or sticks. In order to be assured that the gas cocks are properly lubricated for all conditions, the testing machine is used to test cocks at different temperatures. This is accomplished as shown in Fig. 2. The testing machine is made so that the cock under test can be inserted into the heated oven.

It might be of interest to know that many of the cocks under test are turned "on" and "off" over a hundred thousand

times without failure, which corresponds to about seventy-five years of normal use. The tests show that gas cocks properly designed and lubricated should last indefinitely.

As far as is known, this is the only gas range manufacturer who has ever designed and built a machine for testing gas cocks. It shows the efforts being made to assure satisfactory service to the users of its appliances which it is hoped is helping to further "good public service" within the gas industry.

Policy of San Antonio Public Service Company Reveals Successful Practice in Gas Appliance Merchandising

By B. C. Reber

UNTIL a little more than a year ago, the San Antonio Public Service Company of San Antonio, Texas, devoted a part of their floor space on their first floor to an exhibit of gas and electric appliances. These exhibits were arranged by local dealers in these commodities, they being allotted the space but requested to furnish their own salesmen or demonstrators.

At this time a desire on the part of the company to increase the consumption of gas necessitated a new policy. A commercial department had been created for the purpose of educating both the commercial and domestic consumers to a more profitable and satisfactory use of gas and electricity.

To further encourage the use of gas, the company determined to enter into the retail field, and a space was provided in the basement of the building and fitted up to demonstrate those gas appliances which the company selected for their stock. This stock included one line of gas cook stoves, two lines of space heaters, two lines of water heaters, and several lines of burners, appliances, etc.

Also, at this time, a sales staff was organized and the city proportioned off so that each salesman had an equal opportunity of selling his quota. How this was done makes an interesting story in itself. In making up the consumers' ledgers, the bookkeeping department had divided the city into 53 districts. From these districts, the commercial department mapped off the city into eight sections, the area of the sections being determined by the number of meters set, rather than a number of city blocks, streets, or other common practise of mapping off such territory. As may be seen, each salesman, then, had the same amount of field and the same opportunity.

The sales staff consists of eight men, each salesman having one of the eight sections into which the city has been divided. These men are paid a good salary and a nominal commission. They not only promote the sale of gas appliances, but they make surveys, report complaints and handle gas extensions and services.

The prime motive of the company in establishing the gas merchandising department was to promote the use of gas as a fuel, to increase the number of gas appliances in use, to better living conditions by educating the public in the proper and economical use of gas, and to establish better relations. It has never been their intent to compete with local dealers of gas appliances. In fact, whenever an extension is planned, all local dealers are notified and each has the same opportunity of getting business.

The field which this department is cultivating is one which is often neglected by the dealer. The sales staff of this organization is more of a clean-up squadron going around after the others have been through and picking up such business as they find may be had.

The sales canvass, while it borders on the house-to-house method of selling, is handled in a much better manner. Three days previous to the time that the salesman will call, a letter is mailed out announcing that a representative will call at that time. It is stated that he will make a survey, take care of any minor adjustments, answer questions concerning the use of gas and gas appliances, and offer any assistance possible that will prove of benefit to the receiver of the letter.

In making his call, the salesman carries a report card with spaces for such

To Our Gas Customers:

We have arranged to have our representative call in a few days, and with your permission he will make a general inspection of your gas appliances.

The purpose of this inspection is to make any minor adjustments that may be necessary and to assist you to obtain the most benefit from your gas service.

He will perhaps be able to explain some features of gas service that you are not familiar with.

This offer comes to you, without charge, as a part of our effort to have our customers receive the full benefits from the use of gas for cooking and heating.

Yours very truly,

Appliance Division.

SH/el

Letter announcing salesman's call

S. A. PUBLIC SERVICE CO.
APPLIANCE SURVEY

APPLIANCE 913 12-13-28 2M

Date issued ..... **192**....

To .....
Make remarks on back hereof.

WATER HEATING	HOUSE HEATING	COOKING
Is gas used?.....	Is gas used?.....	Is gas used?.....
Kind of W.H.?.....	Number of Rooms.....	Kind of Range?.....
Type?.....	Number of heaters.....	How old?.....
How old?.....	Number of outlets.....	Condition.....
Condition	Will be prospect for heaters about.....192....	.....
.....		Is range giving satisfactory service?.....
Is W.H. giving satisfactory service?	Furnace?	Will be prospect for new range about .....192....
Will be prospect for new W.H. about.....192....	Type?.....	
	Fuel used.....	

Surveyed by..... **Date**.....**192**....

Salesman's report card

information as is required in completing the survey. This information covers water heaters, house warming and cooking. It also provides spaces to show when the customer might be in the market for any appliances.

The letter paves the way for the salesman, and makes his approach more easy and pleasant. The customer has been notified that he will be there, that he will make a survey of the appliances, and that he is willing to answer questions. It ingeniously avoids any direct mention of selling. It hints that he will be willing to explain the features of gas service, but appears to leave this to the wishes of the customer.

On the other hand, the results from these calls show that they are highly successful. When the salesman has completed his survey and made any minor adjustments that might be required, he finds the prospect in a mood to listen. He is able to show what may be accomplished with gas. He frequently makes an appointment at that time for a demonstration at the display room of the company.

While it is always difficult to determine the exact results that may be attained through such work, a good average shows that 25 per cent of the prospects interviewed turn out to be live prospects, and that 5 per cent of those interviewed will buy within 30 days of the call.

Except for this rather indefinite information, nothing can be shown in the way of concrete results. It is evident however, that a seed has been planted. While that seed may bear fruit today or a year from today, the work has been accomplished. The prospect has been shown the value of gas as a fuel.

If the prospect rents the property but wishes a water heater, such a report is noted on the back of the card and the landlord is canvassed in an endeavor to educate him in the increased property value of a home equipped with a hot water heater. Quite frequently there are only two or three outlets in a four or five room home, and this provides another angle through which sales and business may be increased; for it is evident that the more outlets there are in a building, the greater are the opportunities of increasing the gas consumption.

Arrangements have been completed whereby the company sells appliances on the budget plan. In such instances a small down payment is required, and the remaining payments are carried over a period of 12 months. This enables the customer to have the benefits of a water heater, a new cook stove, or any of the other modern gas appliances that have been developed, without unnecessary strain on the family purse.

A little more than a year of operation has shown this to be a highly successful department. It is, of course, impossible to determine how much the gas consumption has been increased, but an improvement is noted.

A word should be said concerning the display room. In addition to a general line of heaters and stoves, an attractive living room has been arranged which sets forth the beauty and comfort of a gas heater at its best. The display room has been instrumental in closing many doubtful prospects, for it brings them into a homey atmosphere and enables them to see the equipment in use.

Without antagonizing local dealers, the company has rendered a great service, not only to the gas consumers, but to the industry. It has built up good will, it has carried on an educational campaign, it has sold appliances where it is doubtful if few would have ever been sold, and it has increased the consumption of gas as a fuel.

"Pepping-up the Domestic Load"

HERE is a likely looking scheme for increasing the sales of appliances and the domestic load as well. The plan which was originated by Mr. B. A. Seiple, Commercial Manager, Jersey City Power and Light Company, Asbury Park, N. J., is well explained in the letter to the employees which is herewith reproduced.

TO ALL EMPLOYEES:
THIS MEANS MONEY TO YOU—READ IT!

Effective April 26, 1929, a Merchandise Tip system will be inaugurated. This system is designed to encourage all employees to take an active part in building up our business by offering them a substantial additional remuneration for this extra effort.

Attached to this memo you will find five cards called "Employee Tip." Look this card over carefully and you will note that all it requires is your filling in seven (7) lines and then turning the card over to your District Manager. Many times you have talked with neighbors, friends or acquaintances about the conveniences of our electric and gas appliances—and now this can be converted in "CASH" by filling in a Tip card right away.

JERSEY CENTRAL POWER & LIGHT CO.
EMPLOYEE TIP

Date.....

Customer's Name
Address
Town
Interested in
Remarks
When Interviewed
Name of Employee ..... Dept.
Form 1234-28-A.H.

Obverse—Employee Tip Card

RECORD OF FOLLOW-UP

Turned Over to ..... Date
1st Call Result
2nd " "
3rd " "
Sold by ..... Date
Sales Slip No. ..... Amount of Sale
Entered in Month of
Approved by ..... Manager
Amount of Tip ..... Approved,
$ ..... Commercial Mgr.

Reverse—Employee Tip Card

Of course the cash award will be made only on those tips resulting in sales. The schedule of awards is as follows:—

Tips resulting in sales of from

$25 to $100	award	$ 1.00
$101 to $150	award	2.50
$151 to $200	award	3.50
$201 and over	award	5.00
Gas Fired Boiler	award	10.00

also an award of $2.50 for connection of an electric or gas customer on our existing lines or mains.

The rules concerning the plan are few and not difficult to follow:

1st Any tip is good only for 30 days. Be sure and date your tip cards. After 30 days expires it is necessary for you to again interview your prospect before filing a new tip card.

2nd Should two employees turn in the same tip the one reaching the Manager first has precedence. Act promptly.

3rd The customer MUST be interviewed.

Employees of the regular Merchandise Sales Department are not eligible for this plan.

April 26 starts you off—Cash in on this opportunity. It means additional income each month for you. Let's have tips and more tips.

B. A. Seiple,
Commercial Manager.

When The Gas Company Is Liable for Fires Caused by Employees

Other Court Decisions of Interest to Gas Men

By Leo T. Parker

GENERALLY speaking, a gas company is not liable for damages effected by employees who act outside the scope of the employment.

For illustration, in Yore v. Pacific Gas & Electric Co., 277 Pac. 879, it was disclosed that a gang of gas company employees set fire to another's property when smoking cigarettes. The owner of the property sued the gas company for damages.

However, since it was proved that none of the gas company officials or the foreman knew that the workmen were in the habit of smoking cigarettes while on duty, the Court held the gas company not liable, stating the following important law:

"If the master had knowledge of the negligent use of cigarettes or matches by its employees under such dangerous circumstances, it might be liable for damages for retaining in its employ one who persisted in such careless habits. . . . As a general rule, an employer is not liable for damages resulting from fires started by an employee merely to serve his own pleasure or purpose, which acts have no connection with the duties of his employment, and which have not been directly or indirectly authorized or ratified. . . . . There is no evidence that the foreman, or any authorized agent of the appellant (gas company) having charge of the employees, knew that it was their habit to smoke while engaged in working, or that they were actually smoking on the occasion of this fire."

Validity of Municipal Ordinances Regulating Drilling Oil and Gas Wells

Generally speaking, a city ordinance is valid which protects public safety, health and the morals of the community, although such laws deprive property owners in the business or residential districts of just compensation or income from their investments.

For instance, in Marrs v. City of Oxford, 32 F. (2d) 134, a city ordinance was enacted which provided:

"That it shall be unlawful for any person, persons, association of persons, or corporation to drill an oil or gas well . . . at a point nearer than One Hundred Fifty (150) Feet to the streets or the railway track or other boundary. . . . There shall be only one permit issued for one well in each block, except that where more than one producing oil or gas sand shall be found in such block, a permit may be granted for one well to each of such sands, in such block, and that with such exception, it shall be unlawful to drill more than one oil or gas well in a block."

A property owner sued to prevent enforcement of the ordinance contending that it deprived him of an income from his property and violated the State and United States Constitutions. However, it is important to know that the higher Court held the law valid, saying:

"The police power is an attribute of sovereignty to be exercised for the public welfare. . . . The possession and enjoyment of all rights are subject to such reasonable conditions as may be deemed by the governing authority of the country essential to the safety, health, peace, good order and morals of the community. . . . And it is well settled that the enforcement of uncompensated obedience to a legitimate regulation established under the police power is not a taking of property without compensation, or without due process of law, in the sense of the Fourteenth Amendment. . . . The greater the number of wells in a city block the greater will be the annoyance and hazards to the public. Indeed, it would be hard to say that an ordinance prohibiting the drilling and operation of any well within the business or residential districts of a city would be an unreasonable and invalid exercise of the police power."

Legislature Has Power to Enact Statutes Regulating Well Drilling

Also, in the leading case of Winkler v. Anderson, 104 Kan. 1, the Supreme Court of Kansas had for consideration the validity of a State statute which made it unlawful to drill or operate oil or gas wells within one hundred feet of the right of way of any steam or electric line of railway.

A man named Winkler had an oil and gas lease on a strip of land within one hundred feet of the right of way of a steam railway and he filed suit to enjoin enforcement of the provisions of the statute. His lease was valueless if the statute was valid. He claimed that the statute deprived him of property without compensation, without due process, that it denied him equal protection of the laws and that it abridged his privileges and immunities contrary to the provisions of the Constitution of the United States. However, the Court held the law valid, saying:

"The police power extends, not only to the protection of the public safety, health, and morals, but to the promotion of the common convenience, prosperity, and welfare. . . . While oil and gas wells are not nuisances per se, and the business of drilling and operating them is ordinarily legitimate and harmless, it is conceivable that they may become detrimental in a high degree. . . . If the legislature acted from some such considerations as these, it possessed power to fix a limit within which drilling and operating should not intrude."

Person Made Sick by Fumes

In many instances gas companies may eliminate damage suits by acting promptly when notified that gas is escaping.

For example, in Anderson v. Atlantic City Gas Co., 145 Atl. 238, it was disclosed that a gas company was notified twice in the morning that gas was escaping in the street in front of a restaurant. The gas company failed to send employees to stop the leak and an employee in the restaurant became violently ill in the afternoon.

It is interesting to observe that the Court held the gas company liable for the value of the time lost by the restaurant employee, as a result of the illness, stating important law, as follows:

"Corporations manufacturing and distributing gas are held to a high degree of care in the maintenance of their pipes and are required to exercise every reasonable precaution suggested by known dangers. Where the existence of a leak is known, means should be taken at once to avoid injury, and where it should have been known that a leak was likely to occur because of defective conditions of the pipes, negligence may be imputed."

(Continued on page 66)

~ ~ ~ HOTZONE

has a way with the women

IN THE first place he's good-looking and wears his clothes well. The buff jacket and black hat and shoes give him an air of distinction that sets him apart from his fellows. He has the kind of a build that makes heads turn for a second look as they pass him on a showroom floor.

And Hotzone fulfills every expectation of his aristocratic name. He wears well, as the saying goes. A close acquaintance reveals to women the qualities of sturdiness and dependability.

And finally, when women look at the price tag, their shopping instincts tell them that Hotzone is a bargain.

* * *

It has long since been acknowledged that Hotzone performance is the match of any other heater no matter what its price. In addition Hotzone probably holds the record for low upkeep. Now "with its little coat of tan" Hotzone has the eye appeal that reduces the commercial manager's sales cost.

Remember "Hotzone has a way with the women *that sells.*" Write for prices and discounts and put him to work for you. Welsbach Company, Gloucester, New Jersey. Sales Offices in Principal Cities.

Welsbach

HOTZONE

Member American Gas Association

Court Decisions

(*Continued from page 64*)

Gas Company Liable For Injury To Trees

Considerable discussion has existed from time to time regarding the liability and degree of care required of a gas company to protect vegetation against injury resulting from escaped gas. Therefore, the outcome of the leading case of Fullerton v. Glenn Falls Gas & Electric Co., 141 N. Y. S. 838, is unusually important. Here it was disclosed that a property owner owned thirteen shade and four elm trees, standing about twenty feet apart, each tree being about eighteen or twenty inches in diameter. The tops of the trees were large and very nice.

A gas company laid gas mains in front of the property on which the trees were situated. Soon after the gas was turned into the mains, its odor was smelled in the immediate vicinity of the trees. The leaves on the trees began to turn yellow and curl up, and three of the trees did not leaf out the next spring, but died.

The property owner filed suit against the gas company to recover damages for the injuries sustained to his trees. The latter company contended that the leakage of gas did not make a prima facie case of its negligence.

The Court, however, held the property owner entitled to recover $350 damages, saying:

"It seems to me that the conclusion is irrestible that the pipes must have been negligently laid, negligently calked, negligently joined together; otherwise, there could have been no escape of gas. The situation excludes everything but the negligence of the defendant (gas company). . . . There was abundant evidence to support the finding that the trees were killed by gas. I do not think the verdict was excessive."

Distinction Between Rental and Conditional Purchase of Gas Plant Equipment

Under certain laws, which prohibit officials from definitely obligating a municipality to pay for purchased machinery, rental contracts, *with privilege of purchase,* are valid.

For example, in Jones v. City of Corbin, 13 S. W. (2d) 1013, it was shown that a third class city under the commission form of government owns and operates a public service plant. The equipment is insufficient to meet the immediate and future demands of its citizens. The commissioners passed an ordinance by which 15 per cent. of the revenue derived from its plant was set aside and appropriated for the purpose of securing additional machinery.

Thereafter the commissioners passed a resolution authorizing the city to lease, with option to purchase, the necessary machinery and equipment, and to advertise for bids therefor in accordance with specifications prepared by the superintendent of the plant. Among other provisions of the resolution was the following: "Said rental and said purchase, if made, shall be paid out of the fund set aside and provided by the ordinance and not otherwise."

The material provision of the contract is that the lease is for a period of 24 months, and the rental for the first month is $7,446, payable in cash. The rental for each of the succeeding 23 months is payable monthly in advance, to be paid "out of the proceeds of the funds realized as provided by the ordinance."

At the end of the lease the city is given the right to purchase the machinery on condition that all installments of rental have been paid. In case the lease is terminated otherwise than by purchase, the city is to turn the leased property over to the lessor in good condition, natural wear and tear excepted.

Legal proceedings were filed to prevent the commissioners from leasing or purchasing the machinery. However, the Court held the commissioners clearly within their legal rights to do so, stating the following important law:

"This is not a case where the obligation is payable at all events out of the general funds of the city. No tax can be levied to meet the obligation. It is simply a case where the rent is to be paid from revenue derived and to be derived from the plant, and therefore only out of a special fund that will be increased materially by the use of the additional machinery. It is not a case where the general resources of the city will be depleted in case of default. The lessor is given no lien which he may enforce on the plant as a whole. The worst that may happen in case of default is that he may remove the machinery and retain the rentals already paid."

Gas Company Liable For Injury To Workman

Generally speaking, an employer is expected by the law to notify workmen of any unusual and known dangers, of which the employee is unfamiliar.

For instance, in Dobbie v. Pacific Gas Co., 273 Pac. 630, a sheet metal worker, employed by a contractor who was hired by a gas company to reconstruct a blast pipe, filed suit against the gas company to recover damages for personal injuries sustained while performing work.

The facts disclosed that on the roof of the generator building where the employee was injured there was a glass skylight that the gas company had knowingly permitted to become covered to a depth of several inches with cinders and soot discharged from its gas generators. This rendered the skylight invisible to any person on the roof of the building and caused the same to appear to be a part of the solid portion of the roof. The employee being unaware of the dangerous condition of the roof stepped upon the skylight which broke precipitating him to the floor below and causing his injuries.

The gas company attempted to avoid liability by contending that the injured employee was guilty of contributory negligence and that the evidence was insufficient to prove negligence on their part.

However, notwithstanding this contention, the Court held the employee entitled to recover damages for his injuries, stating important law, as follows:

"The owner of premises is not an insurer of the safety of an invitee, but he owes him the duty to exercise ordinary care in seeing that the premises are in a safe condition. . . . A person so invited upon the premises of another may recover from such owner for any injuries received owing to the dangerous condition of the premises known to the owner and not known to the person so invited; but such owner is not bound to keep his premises absolutely safe. . . . The responsibility of such owner for the safety of such person in such a case is not absolute; he is only required to use ordinary care for the safety of the persons he invites to come upon the premises. If there is a danger attending upon such entry, or upon the work which the person invited is to do thereon, and such danger arises from causes or conditions not readily apparent to the eye, it is the duty of the owner to give such person reasonable notice or warning of such danger. But such owner is entitled to assume that such invitee will perceive that which would be obvious to him upon the ordinary use of his own senses. He is not required to give to the invitee notice or warning of an obvious danger."

Gas Consumption Goes Up 73% in Milwaukee, Wis.

Constantly increasing uses of gas in Milwaukee manufacturing plants have sent its industrial consumption upward in great leaps in the last six years, it is revealed by figures kept by the Milwaukee Gas Light Co., of which Mr. R. B. Brown is president.

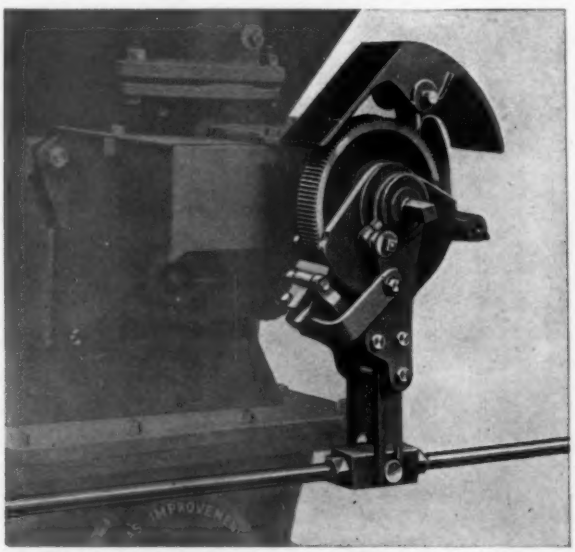
Since 1923, the factory consumption of gas has increased 73.8 per cent in Milwaukee. The average monthly consumption is now 164,000,000 cubic feet while six years ago it was 94,330,000 feet.

Since the first of this year, the consumption has continued to go up. There has been an increase of 18.4 per cent over the 138,500,000 cubic feet average monthly consumption in 1928.

Before 1923 the use of gas in manufacturing processes fluctuated, reaching its previous height in 1920 immediately following the great industrial operations necessitated by the war. There was then a slump but since 1923 each year has seen the consumption mounting steadily.

Since the number of new factories locating in Milwaukee or being started there has been somewhat small, the increase has come by the existing industries finding additional uses for gas. According to Albert Schuetz, gas company engineer, there now are about 1000 different uses for gas in Milwaukee.

GLOVER-WEST
Vertical Retorts



The Speed of Carbonization is different for every different coal.

In the Glover-West System it is regulated at a moment's notice, and without interference with retort-house routine, by adjusting the mask in relation to the pawl and ratchet gear operating the coke extractor.

The gear is protected from breakdown by the free pawl tooth and safety pin.

WEST GAS IMPROVEMENT CO.

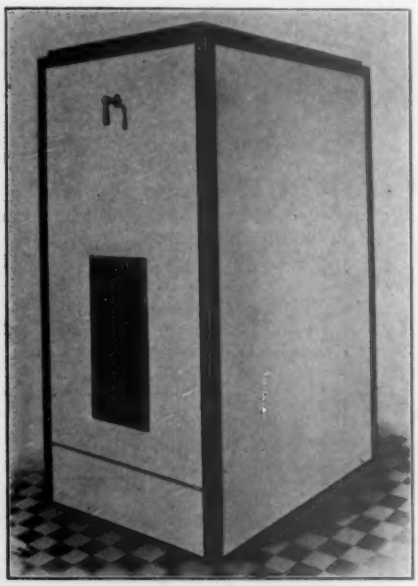
Builders of Coal Gas Plants

441 Lexington Ave. **New York**

Equipment News

New Type of Hot Air Gas Fired Furnace

The American Foundry & Furnace Company of Bloomington, Illinois, who have been engaged in the manufacture of stoves and furnaces using coal for fuel for more than forty years, has taken an innovatory step by publicly claiming gas to be the perfect fuel and in commencing the manufacture upon an ex-

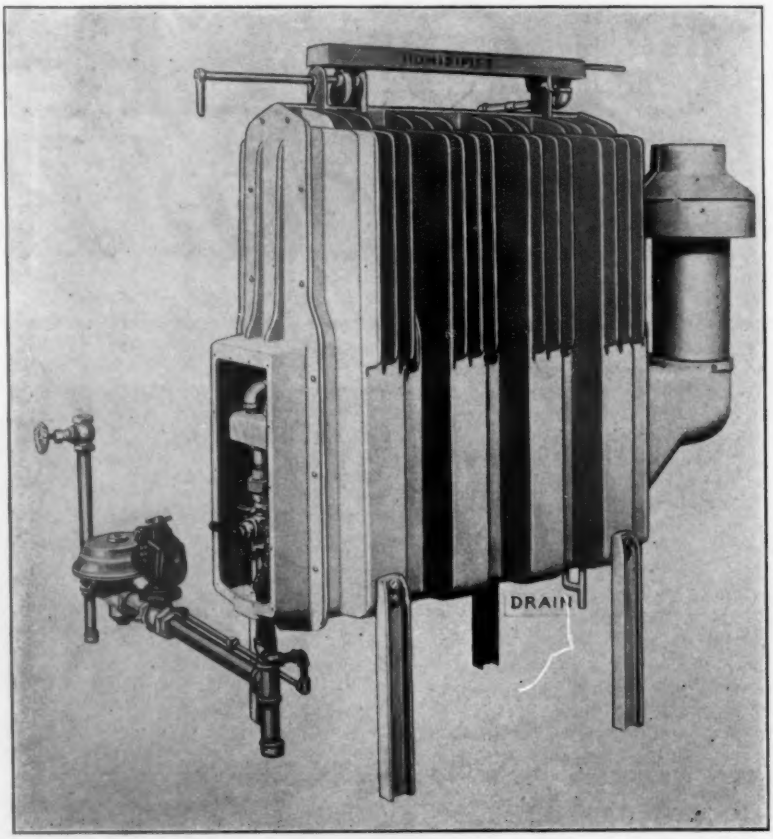


Exterior view of furnace

tensive scale of a new type of hot air gas furnace.

The new furnace is designed in various types and sizes so that houses or buildings from six to thirty rooms can be heated. It is somewhat revolutionary in design and principle. The burners are placed near the center instead of at the base, thus creating the highest temperature at the upper portion. The cold air entering the furnace at the base, is gradually heated as it ascends and when the top is reached, it is at the maximum temperature.

In the upper section, the products of combustion first travel up to the top of the furnace castings. They then divide, turn and flow downward to the bottom through a hollow tube on both sides. They again turn upward into the breeching and flow back through the breeching to the flue connection at the rear where they are discharged into the flue pipe. Both the primary and secondary air for combustion, enter the combustion chamber through a grill and at the rear of the furnace through a similar opening. As the air passes upwards to the burner tips, it extracts heat from the hot surface of the breeching and the inner sides of the flues. Thus, the air is pre-heated before mixing with the gas.



Interior view of furnace

The furnace is constructed in two major parts, each consisting of a unique cored casting. These two castings, when faced together, form only two joints, one at the top and one at the bottom, running lengthwise of the furnace. There are no joints in the hollow flue passes. Lap joints at both top and bottom, clasp the furnace cement, and asbestos packing rigidly. A retaining wall is constructed around the joint in the bottom of the furnace so that there is no chance of any moisture coming in contact with the furnace cement. All condensation drains down the tubes to the bottom of the furnace and thence into a discharge pipe to the sewer. There is no chance for condensation to drip back to the top of the burners, thus clogging them.

The humidifier in the furnace is unique in that it ensures variable humidity by merely turning a small handle which regulates the amount of surface of water in the pan that is exposed.

The burners are of the Bunsen type tips. Each individually inspirates its own primary air and very little secondary air is necessary to complete the combustion. No air adjustment is necessary.

Safe operation is provided by a safety pilot. If for any reason, the gas pilot is extinguished, the main valve is closed and no gas can escape into the furnace. Air filters are provided which remove dust and dirt. Temperature and humidity is extinguished, the main valve is closed stat.

The furnace is the invention of James R. Scott who has been identified with the gas industry at Fort Wayne, Indiana, and other places for several years. He has been appointed manager of the new department of the company.

A New Acetylene Generator

There has recently been placed on the market a new Portable Acetylene Generator for welding and cutting.

The Generator is unique in that the body is made throughout of drawn seamless steel which makes the generator lighter in weight, stronger and more dependable than bodies with the usual joints.

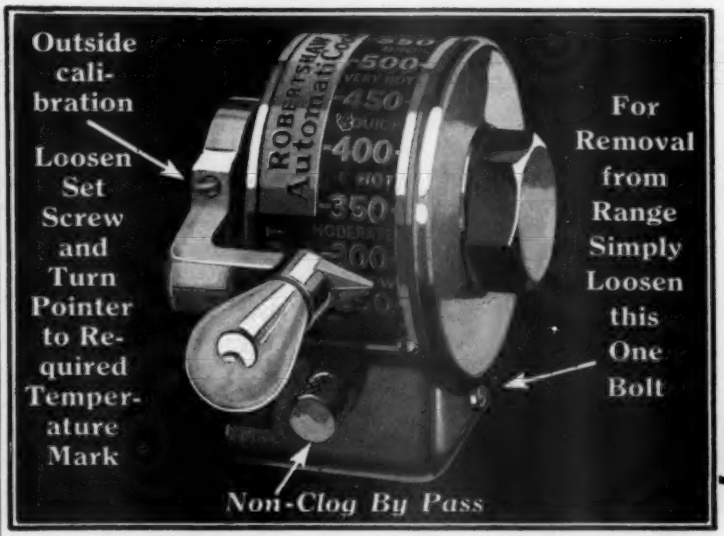
The Generator is made in three sizes—35 lb.—70 lb. and 100 lb. capacity by the Alexander Milburn Company, Baltimore, Maryland.

The Generator has been scientifically developed and has undergone a series of laboratory tests by the Underwriters' Laboratories, Incorporated.

The Generator is extremely simple, it has no clocks, or motors and notably

(*Continued on page 70*)

GAS COMPANIES and STOVE DEALERS



Appreciate the Exclusive Advantages of the "B" Type

ROBERTSHAW AutomatiCook

Outside Calibration. Takes just a few seconds to change the temperature setting if required, by means of a convenient set-screw on the temperature pointer. Merely loosen the set-screw, move the pointer to the proper temperature mark on the dial, and then tighten the set-screw.

Quick Removal. Should the "B" Type AutomatiCook become damaged for any reason, necessitating replacement, it can be removed without disconnecting the range or disturbing the linings or the piping. Requires no mechanical servicing or repairs on the job. Simply loosen one bolt, replace the Thermostat with a spare and tighten the bolt. The job can be done in less than a minute's time.

Non Clog By-Pass Pilot. Will not clog nor bind. Always moves freely and maintains its adjustment. Eliminates servicing, adjusted by turning either to the right or left.

Non-Corrosive Valve Seat. The AutomatiCook is now being equipped with a Raised Non-Corrosive Valve Seat which will resist the corrosive action of gas, eliminating any possible trouble from this source.

Write for 8-Page Folder, illustrating and describing the above advantageous features.

ROBERTSHAW THERMOSTAT CO.

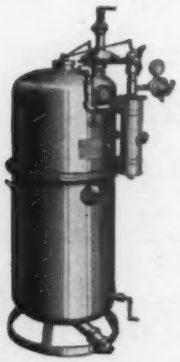
Youngwood, Penna.

The Robertshaw AutomatiCook is now used on more than 80 leading makes of Gas Ranges

Equipment News

(*Continued from page 68*)

few moving parts. Carbide hopper feed control and head are assembled in one unit which can be detached from the seamless steel body by the removal of a few bolts. The carbide feed is controlled by a single valve which, it is claimed, responds to high or low pressure and automatically stops if the pressure



is at zero, or if the filler plug is open or the generator is not properly closed.

It is further stated that the control and operation of the generator is so simple that the carbide feed is uniform and a complete consumption of the entire charge of carbide is assured.

The safety features of the generator under various conditions of usage, upsetting and tipping over is one of the notable features. The Underwriters' Laboratories made tests by tipping the generator at different angles, throwing it over under different stages of operation without causing a rise in pressure of the gas or abnormal working of the machine, it is stated.

The machine is equipped with well developed blow-off valves, pressure control, safety gas purifier and strainer. The component parts of the machine are made with over-size outlets all welded into the seamless body of the generator.

The body has a protective coating inside and out. Handles of ample size, welded on to the body, provide for the convenient transportation.

The cost of generating acetylene gas in the new Milburn Generator is claimed to be considerably cheaper that the cost of cylinder gas.

The entire work is explicit without being verbose and one finds it the rare combination of technical authority and facility of reference. The second chapter of the book, the sentiments of the author to the contrary notwithstanding, is both fundamental and refreshing and rightfully has a place in the text. This chapter covers the elementary theory of heat, with special reference to its relation to mechanical work, and more particularly to the application of heat theories in the instances of the use of steam as a source of energy for driving both reciprocating and turbine engines. Much of the chapter is devoted to an exposition of Temperature-Entropy diagrams and their usefulness in engineering problems affecting the turbine.

An entire chapter is devoted to nozzle design and still another to steam turbine types of blade design. The subject of commercial types has received its proper share of attention. Of equal interest is the work done by the author on the subject of low pressure steam turbines, as well as mixed pressure machines. The chapter on marine turbines will be of interest to many engineers to whom this subject is a specialty.

One section of the book which is devoted to gas turbines should be read with lively interest by gas engineers.

From the standpoint of reviewing fundamentals, the author has included an appendix which should prove of great value to the student and cadet.

Book Review

Handbook of Chemistry and Physics; by Charles D. Hodgman and Norbert A. Lange. Chemical Rubber Publishing Co., Cleveland, Ohio. 1214 pages. $5.00. 13th Edition.

Not only chemists but those engineers who make use of various physical, thermal and other similar tabulated data in the course of their work, will find this book of considerable assistance. Its various tables of data, as well as the text is arranged in an orderly and easily accessible form and has been gathered from authoritative sources.

At various places throughout the handbook typical applications of a number of tables are worked out with numerical examples and an interesting feature is the presentation of some timely laboratory short-cuts and recipes which will be found convenient.

The book is well printed, with gold edges and bound in a flexible, durable binding.

American Society of Heating and Ventilating Engineers' Codes. American Society of Heating and Ventilating Engineers, 29 W. 39th St., New York. 157 pages. 44 illustrations. $5.00. 1929 Edition.

The gas house heating salesman and all others interested in this phase of gas company activity will find a mine of useful data in this publication, which has been gotten out in an attractive loose leaf binder. With the aid of this handbook, the gas house heating engineer or salesman will be able to readily solve any of his problems which have to do with calculating radiation, insulating value of various materials, temperature and wind effects, etc. The loose leaf nature of this book renders it valuable to the end that the user can easily insert therein from time to time additional data as well as various notes of his own.

Sixth Edition of **Steam Turbines** by James Ambrose Moyer, S.P., A.M., Director of Massachusetts Department of University Extension, and formerly Professor of Mechanical Engineering in University of Michigan and Pennsylvania State College. Published in one volume by John Wiley & Sons, Inc., New York. 1929. $4.50.

This volume, which is at once a text and convenient reference on the subject, should have a place in the library if not on the desk of every engineer who has some tangible interest in turbines. The author wisely chose to utilize his first chapter for an historical introduction of the subject. The facts therein set down should be of equal interest to both the student and the practicing engineer. Chronologically the text goes back to the time of Hero and his turbine, through the time of Branca to the more recent types of De Laval and Parsons. The historical features are handled quite concisely without any loss of essential facts, together with very clear descriptions of the various types of machines from earliest times.

Steam, Air, and Gas Power. By William H. Severns and Howard E. Degler. John Wiley & Sons, Inc., New York, 1929. 425 pages. Price $4.

It is a good thing to have on any gas-works library shelf and in the central-office library a well selected group of books outlining the fundamentals of the various branches of science and engineering involved in the gas business. This volume will serve splendidly as a text and reference book for gas-company staffs as they are from time to time confronted with problems of power generation and power application.

The volume was prepared by two experienced professors with the aim of describing "briefly and clearly typical and representative equipment, and to explain the theory of such machines and devices." The presentation is clear, and yet concise. It is well illustrated and attractive to the reader, and sufficiently simple in its mathematical form as not to deter either the practical man or the technologist who is not specially trained in mechanical engineering.

Weeks Appointed Secretary of Publicity and Advertising Section, A. G. A.

Howard F. Weeks, has been appointed Secretary of the Publicity and Advertising Section of the American Gas Association effective August 15, 1929, according to an announcement by Alexander Forward, managing director of the Association.

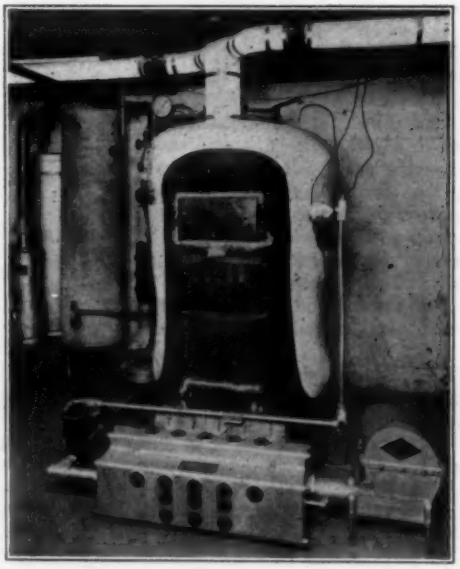
ONLY .124 CUBIC FEET OF GAS

HEATED THIS WHITE PLAINS HOME

And they had plenty of Heat!

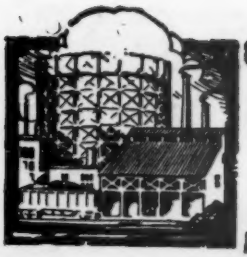
With an S & D No. 8 burner installed under an American Radiator Co. Style S-2805 coal boiler of 1300 ft. rating this home was heated with gas on a consumption of only .124 cu.-ft. per degree day per sq. foot of C. I. standing radiation.

S & D Burners equal and sometimes surpass the efficiency of Gas designed heating plants. Write for information.

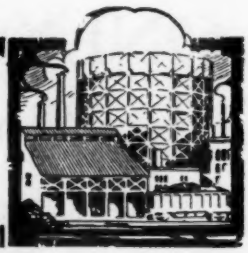


Sweet & Doyle Foundry & Machine Co.

Troy, New York



NEWS OF THE GAS INDUSTRY



A. G. A. and Heating Contractors Approve Sales Principles

Principles of merchandising central plant heating equipment have been approved by the American Gas Association and the Heating and Piping Contractors National Association and executed by their respective officers. The statement of principles which is expected to stimulate the sale of these appliances is as follows:

SINCE gas appliance sales and gas sales are so closely related and so dependent on each other, and

SINCE the service rendered by the appliance to the gas customer is what the customer is ultimately paying for, and

SINCE the proper appliance for a specific service, the correct and safe installation of the appliance, the proper customer instruction in the correct use of the appliance and a speedy service for repair and maintenance of the appliance are necessary factors in every gas appliance sale to a gas utility customer,

FIRST, Manufacturers of gas appliances, dealers in gas appliances, the gas utility and the gas customer will more largely benefit by the gas utility extending its policy of merchandising gas appliances to encourage greater sales by trades.

SECOND, The margin on all gas appliances sold by the gas utility should be sufficient to cover all merchandising costs incurred, and thus enable progressive retail trades to merchandise gas appliances at a reasonable profit. It is recognized, however, that certain expenses incurred in the pioneering of appliances which have not yet met with sufficient local public acceptance to be generally accepted as merchandise items, should properly be charged to the promotion accounts of the utilities and not charged to merchandising.

THIRD, All local sales efforts by gas utilities and trades should be based on the merchandising of those appliances which conform to standards established by specialists of the United States Bureau of Mines, United States Public Health Service, United States Bureau of Standards and the American Gas Association as outlined in bulletins which may be obtained through the American Gas Association.

THE ASSOCIATIONS CONCERNED RECOMMEND to individual gas companies and trades, the advisability and the necessity of greater sales activities in local fields for the ultimate purpose of increasing the sale of gas appliances and of promoting the proper use of gas, and

FURTHER RECOMMEND that proper and adequate service to the ultimate gas consumer be recognized as essential to all progressive sales efforts.

Heating and Piping Contractors National Association,
By WALTER KLIE,
President.

American Gas Association,
By ALEXANDER FORWARD,
Managing Director.

Convention Calendar

September

19-20 Empire State Gas & Electric Assn. Upper Saranac, N. Y.

October

7-10 Third National Fuels Meeting. Philadelphia, Pa. Fuels Division, A. S. M. E.

14-18 American Gas Association, Annual Meeting, Atlantic City, N. J. Alexander Forward, 420 Lexington Avenue, New York City, managing director.

Plan to Attend the A.G.A. Convention

Philadelphia Gas Works Company Publishes Code of Ethics

In a booklet entitled the Gas Works News, the Philadelphia Gas Works Company, which operates the city-owned gas plants, has published a Code of Ethics for distribution among its 3500 employees.

Conrad N. Lauer, president of the company, in announcing publication of the booklet says the Code of Ethics "completely covers the thoughts I wish to convey to you as my idea of the spirit that should prevail in an operating organization. I look for the complete co-operation of every employee with me and with each other, in order that we may fulfill our obligation to the public and to ourselves."

Honor, Courtesy, Self-Control, and Loyalty form the quartette of principles held the most essential for the public utilities employees. A sense of individual responsibility plus the ability to do good teamwork marks the worker who will go farthest on the road of his own and public service advancement.

New Jersey Gas Association to Hold Annual Outing

The Annual Summer Outing of the New Jersey Gas Association will be held on Saturday, September 14, at Centerton Lake Pavilion, near Bridgeton, New Jersey.

The entertainment features include a ball game, quoit contest, water sports and original novelties. The committee announces that the atmosphere is to be that of an "old-fashioned picnic," and extensive preparations have been made to provide an enjoyable outing for all who can attend.

Connecticut Electric Obtains Control of Gas Company

Control of the Waterbury, Conn., Gas Light Company has been obtained by the Connecticut Electric Service Company. The larger stockholders of the Waterbury Gas Light Company, owning a controlling interest in it, turned in their stock for stock of the Connecticut Electric Service Company on the basis of two shares of Waterbury Gas Stock for one share of Electric Service. The same offer is now made to all stockholders.

Natural Gas News from Utah

With the announcement recently from the offices of the natural gas companies that natural gas will be available in Utah cities and towns the middle of September, came also the details of construction progress to date and of the successful completion of one more important chapter in the giant task of bringing this fuel to Utah.

The last section of 18 inch pipe, which forms an underground steel-girded natural gas highway to Utah communities, was hauled into position recently near Old Aspen, Wyoming.

At the present time all of the 122 miles of 18 inch line from Green River to Coalville, and the 34 miles of 16 inch line from Coalville junction to Green River junction is completed; the 66 miles of 16 inch line from Hiawatha Dome to Green River is completed; the 8 inch line from Baxter basin to Green River, 18 miles, is completed while 80 per cent of the 40 mile line from Coalville to Ogden is completed.

(Continued on page 74)

You'll Find It Profitable to *Sell* Time-O-Stat Clock Controls

DESIGNED for absolute dependability and constant accuracy, the Time-O-Stat Clock Control is an outstanding feature that will *help you sell* automatic gas heat. Its attractive appearance immediately catches the eye, and when you demonstrate its simple, faithful operation you have a story of convenience and accuracy which is unrivaled in this field.

The time-keeping mechanism of the Time-O-Stat Clock Control is the product of one of America's oldest and best known clock manufacturers—Seth Thomas. Its accuracy is assured; it requires winding but once every *eight days*, and is so constructed that if this winding is neglected the clock will run for several additional days. Handsomely designed and finished, it presents the maximum in good appearance as well as in satisfactory service. It can be removed by merely pressing a button . . . easy to wind and easy to set!

The simplicity and proven efficiency of the Time-O-Stat Clock Control . . . the exclusive snap action blade feature of the room temperature regulator . . . are points that mean improved performance and more sales. Write today for booklet, if full details are not now before you!

The Time-O-Stat Temperature Regulator is applicable to all types of gas burner systems. The clock actuates the control of temperature variance to day and night requirements.

TIME-O-STAT CONTROLS COMPANY

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Successor to

Absolute Con-Tac-Tor Corporation
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Manufacturers of AUTOMATIC CONTROLS for Oil Burners—Gas Burners—Coal Burners—Electric Refrigerators—Furnace Fans—Mechanical Stokers—Industrial Ovens—Ice Machines—Unit Heaters—Water Heaters . . . also . . . Sign Flashers—Mercury Switches—Electric Heaters—Corrugated Metal Bellows.

Natural Gas News from Utah

(Continued from page 72)

The 40 miles of 10 inch line between Salt Lake and Ogden which will serve Bountiful, Centerville, Kaysville, Farmington and Layton, has been completed.

Construction of the main line is said to be one of the most difficult tasks of its kind in the history of this work in the United States. The main transmission line reaches an altitude of around 8000 feet above sea level, passing over the rugged ranges of the Wasatch and almost paralleling the air mail route.

New Incorporation Law in Indiana

Since the new incorporation law went into effect in Indiana, many firms in the trade are re-organizing their corporate bodies along the lines of the new law, which is much broader in scope than the old law. Also many more firms are incorporating in the state, firms which formerly incorporated under the laws of other states.

A recent ruling by the attorney general of Indiana is to the effect that corporations re-organizing under the new codified Indiana corporation law are not required to add the word "Incorporated" to their official name. The attorney general, in answer to a request for a ruling from the secretary of state's office, said however, that new corporations formed under the codified laws must add the word "Incorporated" or a similar term to the official title.

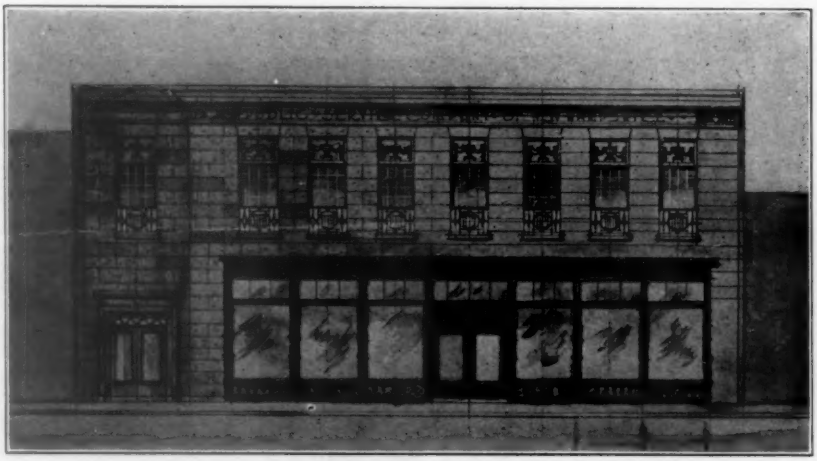
Franchise Granted

The town board of Rockville, Ind., has granted to the Sheridan Gas Utilities Company an indeterminate franchise for a gas system for the city. The franchise will be revoked unless work on the gas plant is under way within two years. In that event a reasonable amount of time will be allowed for the completion of the project.

Public Service Company of New Hampshire to Have New Building

J. Brodie Smith, general manager of the Public Service company of New Hampshire, with headquarters at Manchester, announced recently that contract for the construction of a two story brick and sandstone building which will house the local office and sales force when completed, has been awarded and that work on the construction of the new building would start at once. The new structure is expected to be completed for occupancy about Dec. 1 of this year.

The contract calls for the building to be constructed with a sandstone front, the balance to be of brick. It will be fire proof throughout, and two stories high at the present, although the foundation will be sufficient for six stories in line of future development.



New Building of the Public Service Company of New Hampshire

The building will have a frontage of 63 feet and will be 99 feet deep. There will be six large show windows on the ground floor which will also contain an office for the Nashua manager, Walter F. Norton, and rooms for the accounting department, and supplies.

Plans also call for a good size auditorium where general employes' meetings and the meetings of the women's committees may be held. This will also be used for demonstrations of heating and cooking appliances and the like.

In the rear of the building there will be a lot 59 feet by 50 feet for a garage, and the parking of automobiles.

File Articles of Incorporation

Articles of incorporation have been filed with the secretary of state of Indiana by the Indiana Utilities Corporation of Indianapolis. The corporation has an initial capital stock of 10,000 shares of o par value and is formed "to mine for, prospect for, drill, produce, buy, market, transport and distribute natural gas." The incorporators are L. K. Edmondson, Albert H. Murphy and E. E. Wilson.

U. G. I. to Issue New Stock

Stockholders of The United Gas Improvement Company, Philadelphia, at a special meeting recently unanimously approved converting and increasing the company's capital stock from 6,000,000 shares of the par value of $50 each, aggregating $300,000,000 par value, to 40,000,000 shares without nominal or par value, the new stock to consist of 5,000,000 shares of preferred and 35,000,000 shares of common.

John E. Zimmermann, president of the U. G. I., who was chairman of the meeting, stated that this action revising the company's financial structure approved the recommendations of the Board of Directors made at their meeting on May 24, 1929, and that the new stock would now be issued on the basis of one-eighth of a share of preferred and five shares of common for each of the 3,974,867 shares of the company's $50 par value stock now outstanding.

"In addition to the 19,874,335 shares of common and 496,858⅜ shares of preferred to be issued for the old outstanding stock," Mr. Zimmermann said, "the action authorizes the issuance and disposal of the remainder of the authorized but unissued shares from time to time for such consideration and upon such terms and conditions as the Board of Directors may fix and determine.

"As previously announced by the company, it is proposed to make a 10 per cent. allotment of the no par common stock to be offered for subscription at $20.00 a share to common stockholders of record October 31, 1929, such stock to be paid for on or before December 31, 1929, and to participate in dividends paid after January 1, 1930.

"New U. G. I. preferred stock is entitled to $100 upon liquidation or dissolution and to cumulate dividends at the rate of $5.00 a share annually, payable quarterly, and is redeemable at $110 a share and accrued dividends. The first quarterly dividend of $1.25 on the preferred stock will be paid December 31, 1929. Dividends on the no par common stock will be inaugurated at the rate of $1.00 a share annually, the first quarterly dividend of 25 cents a share to be payable December 31, 1929."

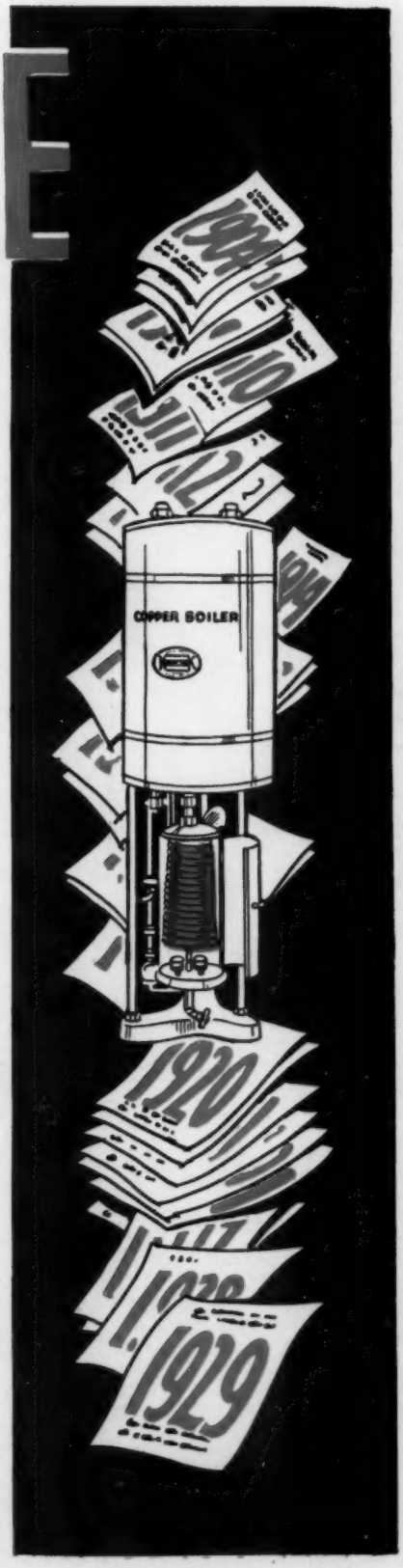
In announcing the U. G. I. refinancing proposal made by the directors on May 24, Mr. Zimmermann said:

"It is believed that changing the stock of the company into smaller units will result in a wider distribution of the shares and will make them available for the small investor, which should be advantageous to

(Continued on page 79)

DEPENDABLE

25 years★ of experience making water heaters designed to last longer than a lifetime



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Cleveland Gas Meters have a reputation for dependable service, the result of over thirty years' experience in manufacturing.

Our thoroughly organized and completely equipped factory assure you that the workmanship, materials, accuracy and general efficiency are unequaled.

"A" Type Meters "B" Type Meters

THE CLEVELAND GAS METER COMPANY

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Trace that leak!

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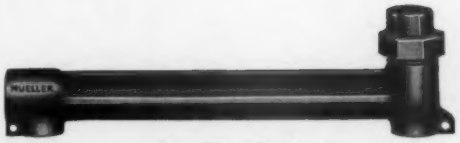


Mueller G-11210

Mueller G-11235

MANY a profit "leak" can be traced to meter depreciation and high maintenance. *Needless* loss can be prevented by using Mueller Rigid Bar Meter Hangers.

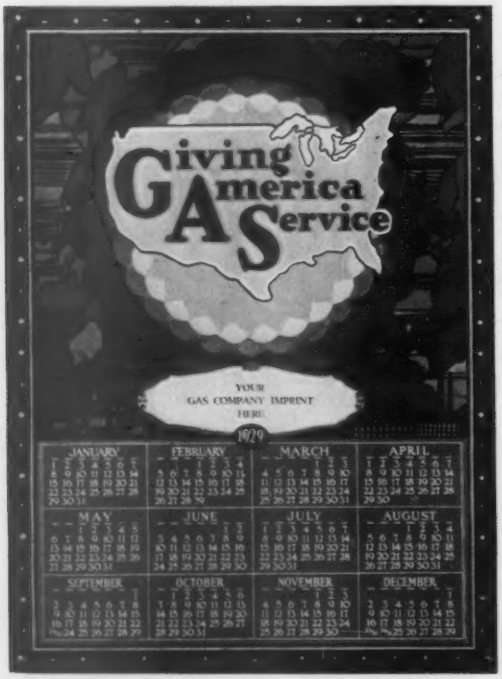
Mueller Meter Hangers provide an exact 90 degree angle between meter connections and meter spuds. Therefore, meters can be set *correctly* and quickly. Leaky installations, frequent servicing and meter strain are avoided because Mueller Hangers are scientifically designed from an experience gained in 72 years of successful manufacture. Every Mueller Hanger is subjected to a 100-lb. air pressure test before it gets the final O.K.

Mueller Rigid Bar Meter Hangers are your assurance against needless profit "leaks." They are made in standard types to meet every need of the gas industry. A request will bring complete information.

MUELLER CO. (Established 1857), Decatur, Illinois; *Branches:* New York, Dallas, San Francisco, Los Angeles; *Canadian Factory:* MUELLER, Limited, Sarnia.

MUELLER

PLUMBING BRONZE AND VITREOUS WARE



Impressions Plus Response

Advertising in most instances, does nothing more nor less than create impressions on the minds of prospective users.

The great advantage of the impressions created by a good calendar, is the fact that they are delivered to the minds of the same people every day, sometimes ten or more times and obviously daily reminders will make more sales than occasional reminders. It is in reality "Poster Advertising" in nine colors right in the home of your customer or prospective one, selling both Good Will and Merchandising at a cost of about one half a penny a month, that is in the form of a souvenir, displayed in your customers home. Samples are now available.

Sign and Mail coupon today.

AMERICAN GAS JOURNAL
53 Park Place, New York

Send further information regarding "Giving America Service" Art Calendar, for 1930.

Company .....

City .....

State .....

Position .....

U. G. I. to Issue New Stock

(Continued from page 74)

the company. This is in line with similar action being taken by banks, trust companies and other public utility holding companies."

Southern Indiana Gas & Electric Contracts for Natural Gas

The Indiana Oil & Gas Corporation, which laid the first natural gas line from the extensive fields east of Princeton, Ind., into Princeton, Vincennes and Washington, has completed a contract with the Southern Indiana Gas & Electric Company at Evansville, Ind., to supply that company with natural gas from the same field. Frank J. Haas, vice president of the Evansville Company and J. E. Bauer and R. Steinhorst of the Indiana Company arranged the details. The Gibson county field was given a thorough test by the artificial gas manufacturing company. The volume of gas in the field is placed by tests at a figure which will guarantee an adequate supply for the next twenty years.

Natural Gas Production Increased

Natural gas production for transportation by the Missouri-Kansas Pipe Line Company in Daviess county, Kentucky, has increased approximately 40 per cent or nearly 5,000,000 cubic feet of gas per day, it has been announced by Frank P. Parish, president. One well showed an open flow test of 1,100,000 cubic feet. Shell Petroleum Corporation of St. Louis, brought in a 3,000,000 cubic feet open flow well August 2, near the Missouri-Kansas lease.

New Gas Line Nearing Completion

Work on the construction of a new gas line which will connect Columbia City, Roanoke and Fort Wayne, Ind., is progressing rapidly and gas soon will be piped from the manufacturing plant there to Columbia city. A line to Roanoke already is in use and a continuation of this line from that city to Columbia City will form a connection with the Northern Indiana Public Service Company in Fort Wayne.

United Gas Reports Earnings

The United Gas Company and controlled companies, with headquarters in Houston, Texas, report consolidated gross revenues for the six months ending June 30, 1929, of $6,484,749 and consolidated gross earnings of $4,103,896. Balance available for federal taxes, depreciation and depletion was $1,299,711, after deducting all prior charges and minority common stock interest of controlled companies, and United Gas company preferred stock dividends.

These earnings do not reflect the company's 20.7 per cent interest in the Mississippi River Fuel corporation or its holdings in Consolidated Gas Utilities company.

New Schedule of Rates Approved

The Massachusetts Public Utilities Commission has announced its approval of the new schedule of rates of the Boston Consolidated Gas Company and ordered that it become operative on October 1. The schedule was filed by the company last February to be effective on April 1, but customers of the company protested and hearings were held by the commission and the date for the schedule to become operative had to be advanced each time. The new rate allows for a service charge of 50 cents a month.

File Articles of Incorporation

Articles of incorporation have been filed with the secretary of state in Indianapolis by the Wabash Consolidated Utility Corporation, with a principal place of business in Vincennes, Ind. The corporation has an initial capital stock of 1,000 shares of no par value and is formed "to carry on the business of mining and of drilling and exploring for natural gas and oil." The incorporators are S. M. Newton, F. L. Tormey and C. E. Josten.

Gets Huge Gas Well

The R. & G. Corporation, recently acquired by the Moody-Segraves interests brought in, early in August, a gas well known as R. & G. Corporation's No. 2 Ed Allen, in the Agua Dulce field, western Nueces county, Texas, making 100 million cubic feet of gas daily. The well is 1,986 feet deep.

Natural Gas Service Established

On August 15 natural gas was blown into the pipes in the city of Evanston, Wyoming. The test was successful and on August 20, "Gas Day" was observed with a general jollification and jubilation. This is part of the gas line from the Hiawatha dome, Wyoming, to Ogden and Salt Lake City, Utah.

High Pressure Gas Pipe Line Under Construction

Construction work on the new high pressure gas line being built from New Albany to Jeffersonville by the Interstate Public Service Company, Indianapolis, Ind., will be completed soon, according to an announcement by Interstate officials.

The new pipe line, 8 inches in diameter, is approximately six miles long and is being built at a cost estimated at $60,000. Completion of the line will connect the New Albany and Jeffersonville gas plants into one system. Both are operated by the Interstate Public Service Company.

The new line will insure better operating conditions and uniform pressure.

Approve Petition to Issue Stock

The Massachusetts State Department of Public Utilities has approved the petition of the North Adams Gas Light Company for authorization to issue additional capital stock of the par value of $200,000. Proceeds from the sale will be applied to the retirement of debt incurred from additions, extensions and improvements to the plant and property which have been made and for similar improvements which are contemplated.

Dixie Gas & Utilities Company Earnings

Report of the Dixie Gas and Utilities Company, a subsidiary of the United Gas Company, for June shows net income of $35,039 after all charges compared with $25,461 earned in May and a deficit of $9,998 for June, 1928. Many economies have been effected in recent months through consolidation of operating organizations and subsidiaries of the company and these improvements are finding reflection in the operating ratio of the parent company. Gas sales are showing a steady volume expansion and with current earnings running at the rate of $3.54 a share for the common stock, it is officially stated that the outlook for the last half of the year indicates a possible gain over this estimate.

Natural Gas Concern Makes Change

The Missouri-Kansas Pipe Line Company, large conveyors of natural gas, has moved its executive office from Kansas City to No. 10 La Salle street, Chicago. President Frank P. Parish says that this was done so as to be in better position to handle its financial matters. Its operating end will continue in Kansas City, under the jurisdiction of B. R. Bay, vice president and general manager.

Gas Property at Fort Scott, Kansas, Purchased by Gas Service Co.

Announcement that the Gas Service Company had bought the gas interests of the Kansas Utilities Company in Ft. Scott, Kansas, was recently made. The Gas Service Company took over this property on August 1.

The property which has been purchased by the Gas Service Company also includes all the pipelines in the city and all of the holdings of the Kansas Utilities Company outside of the city connected with its gas service.

R. C. Brosius, who has been Superintendent of the Hutchinson Gas Company, will be the manager of the Ft. Scott property.

The Cities Service Gas Company has announced that an eight inch pipeline is to be laid from the Petrolia compressor station to the Ft. Scott city gate. This will assure Ft. Scott an ample supply of gas for all purposes.

The new Ft. Scott company will be operated as one of the Union Public Service properties.

New Gas Shop Being Built in Pompton

Work has been started on the construction of a gas distribution shop for Public Service Corp. of New Jersey in Pompton, at a cost of $45,000. Construction work is being done by the Alberg Construction Company of Paterson, under the supervision of Public Service Production Company.

Plans call for the erection of a one-story building which will include a storeroom, garage and offices and also for the installation of four steel tanks in which gas will be stored. These tanks, each forty-two feet long and 10½ feet in diameter, will be placed in a horizontal position.

Manufactured at the Harrison Works and pumped to Pompton, the gas will be stored in these tanks for distribution to Pompton Lakes, Butler, Riverdale, Bloomingdale, Haskell, Midvale and Wanaque.

Personals

John P. Ohmer, since April 1, 1906 superintendent of the Elkhart, Ind., district of the Indiana & Michigan Electric Company now wears a gold diamond-studded button indicating 25 years' service in the American Gas and Electric Company or its subsidiaries. The button was presented him by Thomas F. English of South Bend, head of the Indiana & Michigan company, which supplies power, light and gas to a wide area in northern Indiana.

Patrick J. McIntyre retired from active work with The Brooklyn Union Gas Company, September 1 after 55 years of continuous service, which he began at the age of 19 years. He will receive the diamond set medal for 55 years service on October 1.

In 1874 Mr. McIntyre joined the staff of The Brooklyn Gas Light Company, which was merged with his present employer, The Brooklyn Union Gas Company, in 1895.

His first position in the company was in the coal gas plant where he measured coke. He soon became a general utility man, doing whatever was required, which sometimes included painting gas holders.

From general utility man, Mr. McIntyre advanced to fitter's helper and worked in what was then called the meter shop, driving a wagon. In time he became a fitter or meter setter. Being especially trustworthy and careful, he was given the job of night man at 180 Remsen Street. In this capacity he had to watch the building, go out on night complaints and to fires.

Patrick J. McIntyre

Mr. McIntyre collected from prepayment or "quarter" meters, and in doing his duty in protecting his company, he often had arguments with the cash customers who used these meters, as he seldom found one that did not contain foreign coin, slugs and other substitutes for money. In his 6 or 7 years of collecting from prepayment meters he was thoroughly convinced that the "quarter" meters created more ill will and disagreements than the service they afforded were worth.

In recent years Mr. McIntyre has been given a desk in the Brooklyn Branch where he has busied himself with matters pertaining to collections.

Nicholas Elbogen recently resigned his position as Industrial Engineer for the Lafayette District of the Northern Indiana Public Service Company to become associated with the Derby Gas & Electric Company, Derby, Connecticut.

In his capacity of Gas Sales Engineer, Mr. Elbogen will promote the sales of gas for industrial and house heating purposes in the cities of Derby, Shelton, Ansonia, and Wallingford, which are subsidiary properties of the Utilities Power & Light Corporation.

W. S. Dicken has recently resigned his position as gas sales manager of the Puget Sound Power & Light Company, Bellingham, Wash., to accept a position in San Francisco with the Kellman Laundry Co.

James A. Rees, who has been field manager of the Securities Department of Henry L. Doherty & Co., at Des Moines, Ia., has been selected to be the head of a field office in Little Rock, Ark., and Shreveport, La. Mr. Rees also will have charge of an office at Memphis, Tenn. At Little Rock the office is being opened in the new building occupied by the Arkansas Natural Gas Corporation.

His place at Des Moines has been taken by Russell P. Jones, formerly a salesman in the office.

William B. Knight, who has been associated with the North Attleboro, Mass., Gas Light Company for 42 years as superintendent, has resigned and will retire from active work. Mr. Knight located in North Attleboro in 1877 to assume the position of superintendent of the gas plant.

S. J. Nyswonger has been transferred from Meadville to Erie, Pa., where he has assumed the duties of Sales Director of the Northwest Region of the Pennsylvania group of properties of the Associated Gas & Elec. System. Messrs. H. W. Barrett and William Fitch have been established in Meadville and Warren, respectively, as Assistants to Mr. Nyswonger.

H. D. Keiller has recently been made manager of the Utah Valley Gas & Coke Company, Provo, Utah. Mr. Keiller was formerly of Los Angeles.

R. Leidy, former superintendent of distribution at the Wichita Gas Company, has been promoted to operating superintendent of the Hutchinson, Kansas Gas Company, succeeding R. C. Brosius who recently was promoted to manager of the Ft. Scott Gas Company.

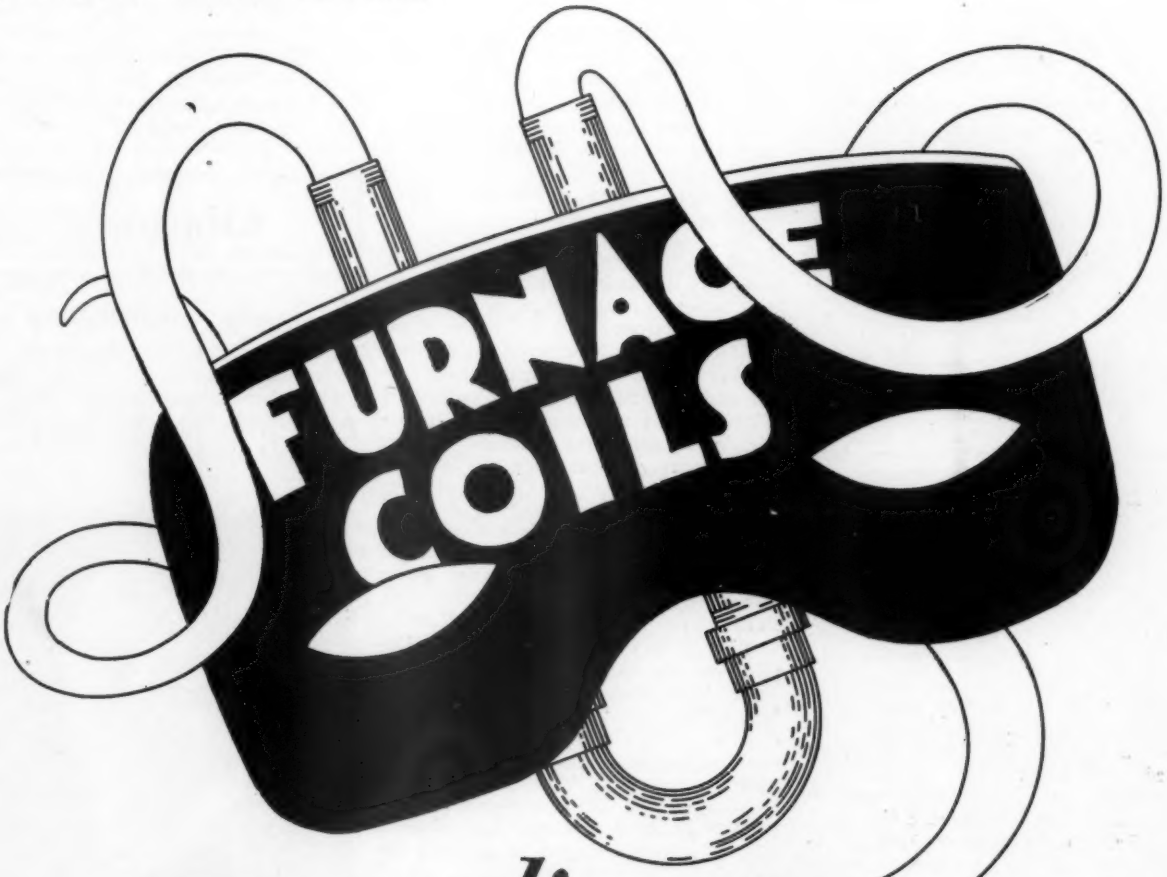
Hal F. Goode has been promoted to superintendent of distribution at Wichita, taking Mr. Leidy's job. Mr. Leidy has made very rapid progress and has had quite a number of promotions since he entered the gas business in Wichita in 1920.

P. L. Smith recently terminated his connection with the North American Light & Power Co., Chicago, to become associated with the National City Company, the investment banking department of the National City Bank. He will have charge of the company's public utility financing, at which he is a recognized authority.

Mr. Smith started with the Company in 1916, as bookkeeper for Scott Brown. He later became assistant secretary and assistant treasurer. He handled many details of the reorganization in 1926, and at that time became treasurer of the Company, a position he held until his resignation.

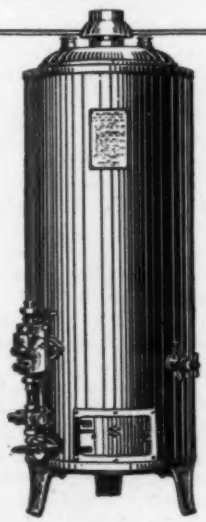
Gordon M. Peterson has recently been appointed Director of Educational Work, Commercial and Accounting Departments, Electric and Gas Company, Public Service Corporation of New Jersey, succeeding Walter S. R. Dickinson, who resigned to take a position as director of personnel for a large Chicago department store.

(Continued on page 82)



. . . *are stealing your* PROFITS

LET US SEND YOU OUR DEALER PROPOSITION



HAVE you ever given thought to the hole the furnace coil eats into your domestic gas sales in the winter months?

Then think of it this way:

The average family is spending from three to six dollars per month for furnace-heated water, and do not know they are spending it, because they have been led to believe that the furnace coil gives them hot water free.

That three to six dollars per month per customer should be yours — and can be if you will go after it.

The new Humphrey's fall sales plan is designed to help you get that business.

Send for your copy today.

HUMPHREY
KALAMAZOO
AUTOMATIC GAS WATER HEATER

The HUMPHREY COMPANY — Div. of Ruud Mfg. Co. — KALAMAZOO, MICHIGAN

Personals

(Continued from page 80)

George B. Webber was appointed Associate Director of Educational Work, in charge of vocational training.

Mr. Peterson graduated from Princeton University in 1925 and started with Public Service as a commercial cadet that year. He completed the cadet course in August, 1928, when he was made assistant to Mr. Dickinson.

Mr. Webber graduated from Cornell University in 1925, and took his Master's degrees, M.S. in 1926. He also started with Public Service as a commercial cadet and completed the course in July, 1929.

Frederick C. Freeman, vice-president of the Providence Gas Company and David Daly, president of the Blackstone Valley Gas & Electric Company, have been elected as members of the Industrial Development Council of the Providence, R. I., Chamber of Commerce. The council includes 18 leading business men of the state, who will develop Providence to its full industrial potentialities.

George L. Cullen recently resigned as secretary of the Pennsylvania Gas Association and Frank W. Lesley has been elected to the office.

Mr. Lesley has been comptroller of the Pennsylvania Gas and Electric Company, York, Pa. since December, 1928. Previously, for six years he was field auditor in the Consolidated Corporations Division, Income Tax Unit, Treasury Department. He is a graduate of the Wharton School of the University of Pennsylvania.

Frank W. Lesley

Mr. Cullen, who is sales manager of The Harrisburg Gas Company, served as secretary-treasurer of the Association for the past eight years. At the April meeting in Philadelphia he resigned as treasurer and was succeeded by W. G. Sterrett of the Philadelphia Suburban-Counties Gas and Electric Company.

As a token of appreciation of Mr. Cullen's long and capable service, Council of the Association voted him the Association's medal, which ordinarily is given only to past presidents.

Robert J. Phillips was recently appointed to the position of manager at the 14th Street District Office of the Commercial Department of the Consolidated Gas Company of New York. Mr. Phillips has had an interesting and rapid advancement through the various district office positions and now enjoys the distinction of being the youngest District Office manager in the company.

George R. Armstrong has been named general superintendent of construction for the Louisville Gas & Electric Company to succeed A. G. Butler, under whom he had served as assistant. Mr. Butler was promoted to manager of the Pittsburgh Branch of the Byllesby Engineering and Management Corporation.

Mr. Armstrong, who was born in Terre Haute, Ind., October 6, 1898, entered the employ of the Company in 1922. Previous to that time he was for two years with the Armstrong Vann Cotton Co., of Muskogee, Okla. He was graduated from Rose Polytechnic Institute, class of 1921, with a bachelor's degree in chemical engineering.

Don Daykin, who has been superintendent of the Jackson, Mich. Gas Plant of the Consumers Power Co., for several years has been transferred to the Saginaw River Gas Plant where he is now superintendent. Mr. Daykin is succeeded by Frank Dees, who has been assistant superintendent for some time.

Horace G. Taylor has been apponted manager of the Lawrence, Mass. Gas & Electric Company with general supervision over both the gas and electric departments. Mr. Taylor has had an unusually broad experience in gas engineering work, having previously followed this type of work in England, Holland, New Zealand, Australia and various cities in the United States.

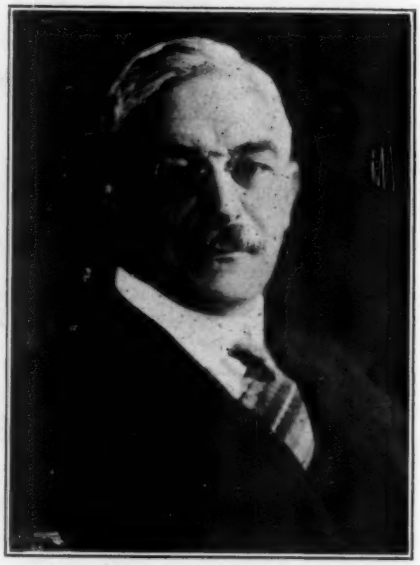
F. A. Leach, Jr., recently retired from active service as vice-president and general manager of the Pacific Gas & Electric Company, San Francisco. Mr. Leach entered the employ of the Oakland Gas Light & Heat Company, long ago taken over by the Pacific Gas & Electric Company, 31 years ago as a clerk. He will be succeeded by Paul M. Downing, for years vice-president in charge of electrical construction and operation.

W. G. Jens, formerly manager of the Pittsburgh Branch of Byllesby Engineering and Management Corporation, has been appointed operating manager of the Duquesne Light Company at Pittsburgh, according to a recent announcement. A. G. Butler, formerly general superintendent of construction for the Louisville Gas and Electric Company, Louisville, Kentucky, succeeded Mr. Jens as manager of the Pittsburgh Branch of Byllesby Engineering and Management Corporation.

Obituary

JAMES T. HUTCHINGS

James T. Hutchings, vice president of The United Gas Improvement Company in charge of engineering development, died suddenly on Saturday, August 17, at Ocean City, N. J. Heart disease was the cause.



James T. Hutchings

He is survived by a widow, formerly Miss Frieda Schick, of Philadelphia, and one daughter, Mrs. H. H. Parcher, Jr.

Mr. Hutchings entered the employ of The U. G. I. Company in 1920, as assistant general manager. In August, 1921, he became general manager, and two years later was elected vice president in charge of operations. In February, 1927, he became vice president in charge of engineering development.

He attended Amherst public schools and was graduated from Massachusetts Agricultural College with the degree of bachelor of science in 1889. His first position after graduating was with the Thomson-Houston Electric Company, of Amherst, in which he remained about four months. In that same year he came to Philadelphia to accept a position as foreman of wiring with the Germantown Electric Company, and later became superintendent of the West End Electric Company, in which position he remained until that company and numerous other small companies in the city were consolidated into the Philadelphia Electric Com-

(Continued on page 84)

"The Ridgways Know How"

Said the Elevator Inspector.

What he meant was this:—

We make only one thing. That one thing is Freight Elevators.

Consequently we make the Greatest thing in Freight Elevators ever produced.

In other words

WE ARE SPECIALISTS IN FREIGHT ELEVATORS.

And as the Elevator Inspector who spends his life day after day going over all sorts of elevators, says

"Ridgway Knows How"

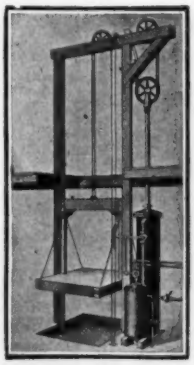
By the way, one of the best elevator men said to "Old Hook 'er" the other day at the Elevator Erectors Banquet, with a grin:—

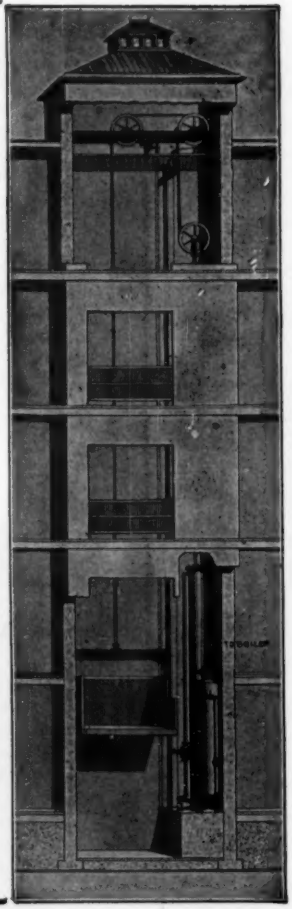
"Ridgway you have a wonderful machine in that elevator of yours and it is the hardest thing to fight. **If a man has steam he is a darn fool if he don't get your elevator regardless of price. But you bet I don't tell him that."**

And he laughs at the fellow who don't

"HOOK 'ER TO THE BILER"

Direct Acting





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Elevator Makers to Folks Who Know **Over 3,000 in daily use**

SUPERIOR

Gas Meters

Provers

Service Cleaners

Diaphragms

Repairs

SUPERIOR METER CO.

167 - 41st Street
Brooklyn, N. Y.

James T. Hutchings

(Continued from page 82)

pany. From 189 to 1904 he was employed by the latter company as assistant electrical engineer.

Then followed sixteen years with the Rochester Gas and Electric Corporation during which he held the positions of superintendent of the Electric Department, assistant manager, general manager and president. He capably filled the latter position for two years, until 1920, when he entered U. G. I. employ.

Trade News and Construction

United Engineers & Constructors, Inc. Activities

Societe Financiere De Transports Et D'Esterprises Industrielles of Brussels, Belgium have placed a contract for a 6' Carburetted Water Gas Apparatus together with the necessary operating floor, blower unit, blast pipe, pump, boiler and miscellaneous small piping for La Plata, South America.

The Iowa Electric Company of Cedar Rapids, Iowa, has contracted for an additional water gas apparatus for their Muscatine, Iowa, plant. This apparatus will consist of a 6' U. G. I. Carburetted Water Gas Plant, arranged for soft coal operation, and with the set will be provided the necessary operating floor for the new set, and re-construction of the floor for the old set.

The Utica, N. Y., Gas and Electric Company has awarded a contract for an 8' 6" U. G. I. Producer, and the necessary auxiliary apparatus and gas connections.

The Philadelphia Gas Works Company has purchased an additional U. G. I. High Duty 4-pass condenser, for installation in the Station "B" Plant.

The Societe Financiers De Transports Et D'Enterprises Industrielles of Brussels, Belgium has awarded a contract for a Gas Booster Unit. This Booster will be installed in the water gas plant at Rosario, South America.

The Connecticut Light and Power Company of Waterbury, Conn., have ordered for their Norwalk, Conn. Plant, a U. G. I. 4-pass, High Duty Condenser and gas connections.

Ross C. Cornish Joins Semet Solvay Engineering Corp.

Ross C. Cornish, of Philadelphia, has resigned from the U. G. I. organization to become chief engineer, Gas Division, Semet-Solvay Engineering Corporation, effective September 1. His headquarters are at 40 Rector Street, New York City.

Mr. Cornish, who was graduated from the University of Wisconsin in 1897, has had broad experience in the gas industry. He began his career as superintendent of distribution for the Milwaukee Gas Light Company, and later was assistant superintendent of the company's coal and water gas plant. In 1900, he became superintendent of operations and construction for the Racine Gas Light Company and three years later returned to the Milwaukee company as assistant engineer. While in Milwaukee he was associated with R. B. Brown in consulting work for a number of mid-west and western plants, chief of which was the Utah Gas and Coke Company, Salt Lake City.

Ross C. Cornish

In 1908, Mr. Cornish became manager of the St. Joseph (Mo.) Gas Company and in 1910, chief engineer of the American Gas Company, Philadelphia, in charge of design, operation and maintenance of that company's gas and electric subsidiary properties. When the American Gas Company was acquired by U. G. I. in 1925, he was appointed assistant to the vice president in charge of engineering and development.

While with the American Gas Company, Mr. Cornish was also engaged in consulting work for the Old Colony Gas Company, Weymouth, Mass. and the Panama-Colon Gas Company at Panama and on report and valuation work and the preparation of data used in various rate cases.

General Refractories Company Adopts New Selling Plan

General Refractories Company, has recently adopted a new policy of selling their high temperature cements, GREFCO Chrome High Temperature Cement and STANDARD Silica Bonding Cement. The new policy involves selling through dealers in all industrial centers throughout the country.

The dealer plan itself includes liberal discounts, exclusive territories, complete protection, sales and correspondence service, sales and advertising literature, and advertising service.

Many dealers have already shown considerable interest in this new policy and territories are rapidly being closed by this plan.

G. R. High Temperature Cements can now be obtained more quickly through dealers.

R. V. Burnette With Pittsburgh Equitable Meter Company

After completing the Pittsburgh Equitable Meter Company special salesmen's training course, which includes thorough instruction and training in different departments of the factory and offices at Pittsburgh, R. V. Burnette now represents that company from the Chicago office.

Burnette was formerly with the Standard Tank Car Company, National Malleable and Steel Castings Company, and the Standard Seamless Tube Company. His work in actually building Pittsburgh Equitable products has given him valuable experience.

Time-O-Stat Distribution Expanding

The Time-O-Stat Controls Company, Chicago, Ill., announces that Ray G. Schott, has recently been appointed manager of the New York office, located at 11 West 42nd Street.

Mr. Schott knows the automatic control business thoroughly, and his long experience in this business is certain to prove helpful to the trade of the eastern seaboard. The establishment of the various Time-O-Stat branches has given to the company the opportunity of very closely contacting the entire trade. Prompt, thorough, nationwide service is now available.

Simultaneously, the announcement was made that Gerald E. Spates has been appointed by Time-O-Stat to take charge of the Detroit office, 4270 Second Boulevard. Mr. Spates, for the past three years, has been sales engineer at the factory, and has a background of diversified experience. He will handle all contacts with the trade in the Detroit territory, rendering a full measure of helpful cooperative assistance.

Mr. Carl A. Scholle, who until recently was in charge of the New York office, will give all his time to the distributing organization. He will be in constant touch with Time-O-Stat Distributors throughout the country, and will travel direct from the home offices.

As announced immediately following the merger, Time-O-Stat policy calls for nationwide distribution, with complete stocks at the several points and competent

LARGER GAS SALES to OLD CUSTOMERS

"THERE'S A ROBERTS UNIT FOR EVERY
SIZE and TYPE of HEATING PLANT"

ROBERTS
CONTROLLED
GAS HEATING UNIT

Josh Whitehead once said, "Makin' money in the grocery biz'ness 'aint huntin' up new customers all the time, it's sellin' yer old ones **ev'rything from soup to nuts."**

That's true in the gas business. The Roberts Controlled Gas Heating Unit changes your gas range customers with niggardly sized monthly gas billings into real profit making house heating accounts.

There is nothing complicated or difficult in selling your customers the convenience and comfort of gas for house heating. This is particularly true when you offer them the Roberts Unit. Its many exclusive features make even the most energetic home owner enjoy staying away from the furnace. Write to-day for the Roberts Sales Plan with complete house heating data.

ROBERTS-GORDON APPLIANCE CORPORATION
SUCCESSORS TO ROBERTS GAS BURNER CORP.
Delaware Ave. at Tupper Street, Buffalo, N. Y.

MOST HEAT PER DOLLAR

Trade News

(*Continued from page 84*)

engineers in all important localities. From time to time announcements of new Distributors have been published, and the most recent appointments are:—

Braid & Haberkorn, Inc., 940 Speer Boulevard, Denver, Colorado; J. H. Lym, 724 McIntyre Bldg., Salt Lake City, Utah; Cline Company, 535 W. Main Street, Oklahoma City, Okla.; J. Sylvan Bowers, Heating Specialty Co., 3805 Page Boulevard, St. Louis, Missouri; Northwest Time-O-Stat, Distributors, 2707 E. Lake Street, Minneapolis, Minn.; American Appliance Co., 1214 Harvey Street, Omaha, Nebraska.

Three Companies Consolidate and Form the Stacey Engineering Company

On Saturday, August 31st, negotiations were completed whereby The Stacey Engineering Company, a new Ohio corporation operating as a holding company, took over the following manufacturing concerns:

The Stacey Bros., Gas Construction Company of Cincinnati, Ohio.

The Connersville Blower Company of Connersville, Indiana.

Wilbraham-Green Blower Company of Pottstown, Pennsylvania,

all of which have for a long period of years been engaged in the construction of gas holders, blowers and other apparatus used by gas, by-product gas companies and oil companies. In addition to these three companies, the new concern has a substantial interest in other allied concerns.

The new concern is headed by Beman G. Dawes, Chairman of the Board of The Pure Oil Company, who has had many years' experience in both the gas and oil business, and with him are associated Carmi A. Thompson of Cleveland, F. S. Heath of Columbus, and others, as well as a number of the operating heads of the concerns named.

The Stacey Engineering Company is incorporated with an authorized capital of $2,500,000 of 6% preferred stock, 150,000 shares of "A" stock and 200,000 shares of "B" stock, none of which will be offered to the public at this time. The Directors of the new company are as follows: B. G. Dawes, F. S. Heath, Carmi A. Thompson, Wayne Stacey, William A. Miller, John T. Wilkin and Chas. A. Ward; and the Directors have elected the following officers: B. G. Dawes, Chairman; Carmi A. Thompson, President; John T. Wilkin, F. S. Heath and Wayne Stacey, Vice-Presidents; D. H. Mulloney, Secretary; Chas. A. Ward, Treasurer.

All three of these companies will be officered by their present organizations. It is the purpose of the new company to furnish additional capital for a large expansion of the business. In addition to this, many economies will be effected by uniform operations of the several companies in reaching similar markets. It is also expected that a largely increased business with the oil trade will be built up, a market which these companies have only touched upon in the past.

The home offices of The Stacey Engineering Company will, for the present, be located in Columbus, Ohio.

New Literature on Orifice Meter Utilization and Operation

A new 6 x 9 book, bound in durable Castillian cover, containing 104 pages, about 100 illustrations and numerous tables, has just been published by Metric Metal Works of American Meter Company for use in the operation of Westcott orifice meters for gas, air, steam, oil or water.

This book has been designated as Bulletin E-2 and is distinct from the new Catalogue EG-2 on Westcott orifice meters, which has also been made available to present and prospective users of this type of meter.

Other publications that have just been issued by Metric Metal Works of American Meter Company are:

Metric Rate-Volume Controller Bulletin E-5, describing the method of installation of rate-volume controllers for automatically controlling the rate of flow of air, gas, oil, steam, water and other liquids.

Bulletin E-3 Metric Indicating Flowmeters for gas, air, steam, oil and water.

Laboratory Bulletin E-1, containing complete description of American Meter Company's laboratory at Metric Metal Works, Erie, Pa., with detailed discussion of preparation of equipment and procedure during test.

McCoy Appointed General Sales Manager Judelson Dryer Corp.

William P. McCoy has been appointed General Sales Manager of the Judelson Dryer Corporation, Moundsville, W. Va., manufacturers of Judelson Clothes Dryers.

Mr. McCoy was formerly Sales Manager of The Cleveland Gas Burner and Appliance Co., Cleveland, Ohio, and for three years was Sales Manager of the Gas Range Division of Abendroth Bros., Port Chester, N. Y.

Prior to his connection with the latter company he was, for twelve years, on the Home Office Sales Promotion Staff of the Welsbach Company, Gloucester, N. J.

Mr. McCoy is well equipped for his new work and is widely known in the gas industry.

New Judelson Dryer Plant Completed

Judelson Dryer Corporation announces the completion of their new manufacturing plant in Moundsville, W. Va.

This factory is under the personal management and supervision of Mr. Julius Judelson, who has been engaged continuously in the manufacture of drying equipment since 1892.

Judelson Clothes Dryers have been manufactured for many years by the Domestic Laundry Equipment Corporation of Long Island City, New York. Most of the work done at the Long Island City plant was built to order upon specifications by leading architects and involved large installations.

The Moundsville plant will make two styles of dryers in several sizes for the gas company and dealer trade. The drawer, or extension rack type, will be furnished in two and three drawer sizes. The two drawer size has a twelve sheet rack capacity, the equivalent of sixty-five feet of clothes line. The three drawer size has an 18 sheet rack capacity, equivalent to 97½ feet of clothes line.

The standard cabinet type will be furnished in two sizes. The larger has a twelve sheet rack capacity, the equivalent of sixty-five feet of line—which capacity is in excess of the full load of a domestic washing machine.

A smaller cabinet type dryer will be furnished in a size suitable for installation in kitchens or other convenient locations in homes or apartments. This dryer has a rack capacity equivalent to thirty-six feet of clothes line.

The Domestic Laundry Equipment Corporation will continue as before, and will be under the management of Mr. Allan H. Judelson. It will be kept running at full capacity to supply special equipment to the architects, builders and contractors in New York City and vicinity.

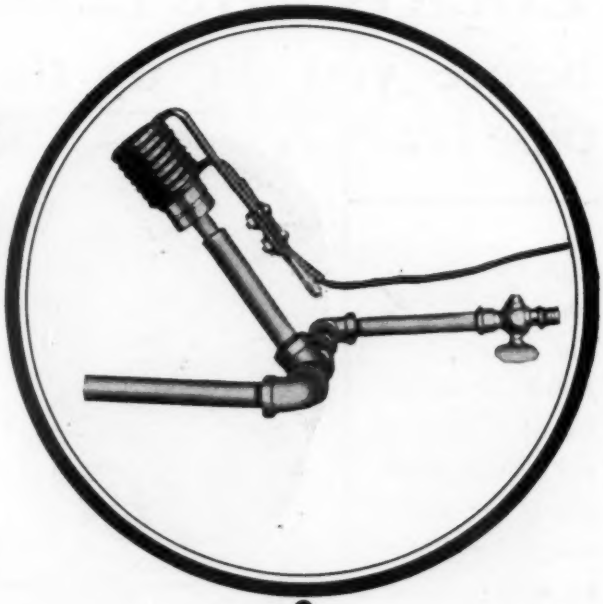
The officers and executive personnel of the Judelson Dryer Corporation is as follows: Julius Judelson, President and General Manager; H. C. Ogden, Vice President; R. W. Nelson, Treasurer; J. F. Collins, Secretary; W. P. McCoy, General Sales Manager.

A Fine Piece of Publicity

Servel Sales, Inc., New York and Evansville, Ind., recently issued a pamphlet entitled, "The Secret of Silence in Refrigeration," which is entirely educational along the lines of gas refrigeration. It shows the developments of Electrolux from the beginning, illustrating each step up. They use the elements, alcohol and air for the formula, and they first ask you to try a simple experiment as follows:—Pour a little alcohol on the back of your hand (rubbing or wood alcohol will do) and blow on the alcohol. The spot will feel cool. Blow on your other hand where there is no alcohol and it will not feel cool. This is the foundation for the development, and it takes you along through the various stages of gas refrigeration, with illustrations each step.

It is a booklet of great educational value to every one who has to answer questions on gas refrigeration. Servel Sales, Inc., will send a copy on request.

AN OUTSTANDING CONTRIBUTION to GAS HEATING



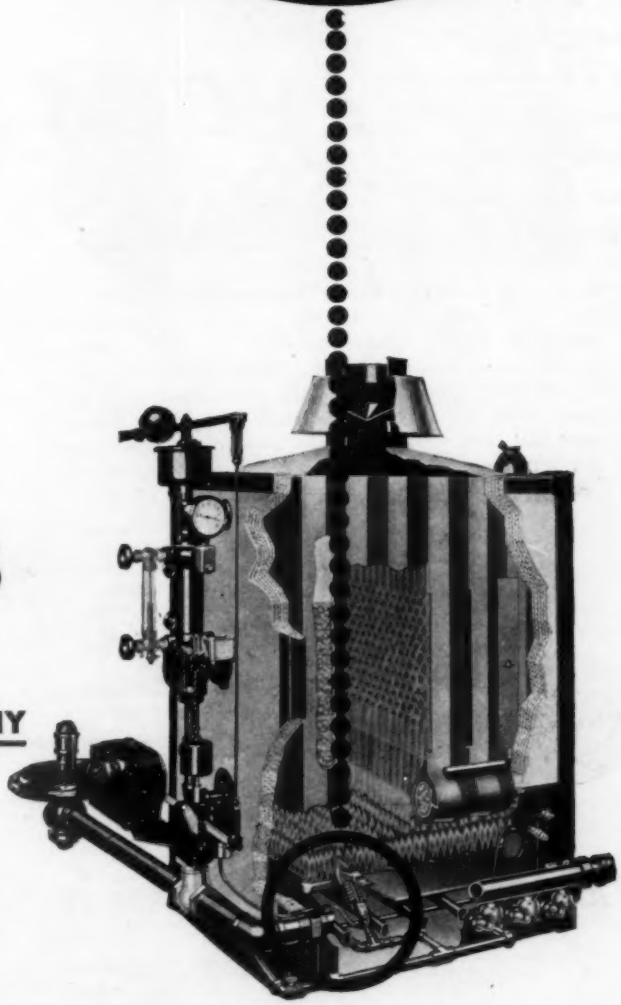
• THIRD •

VAPOR-TENSION THERMOSTATIC PILOT

OPERATES ON PRESSURE CAUSED BY VAPORIZING A VERY VOLATILE LIQUID. AFTER INITIAL SETTING NO FURTHER ADJUSTMENT REQUIRED . . . .

FOUND ONLY ON

IDEAL GAS BOILERS



MADE BY

AMERICAN RADIATOR COMPANY

SOLD BY

AMERICAN GAS PRODUCTS CORPORATION

376 LAFAYETTE STREET . . NEW YORK

LOCATE THE LEAK before you dig up the pipe . . .

Make two search holes in the street pavement where the leak is suspected and place the indicator over the search hole with porous tile downward — and it will indicate the exact location of the leak!

No. 3406

Tycos

Short & Mason
(English Manufacture)

With this hypersensitive Tycos Gas-Leak Indicator, you can locate a leak in the main exactly—without having to do any hit-or-miss digging. With crowbar or pick make two search holes about fifteen feet apart in the street pavement directly over the line of the main where the leak is suspected. Place the indicator over the search hole with the porous tile downward, packing the space surrounding the instrument with clay or other substance to prevent leakage of gas.

No. 3405

The Tycos Gas-Leak Indicator is constructed on the well-known scientific principle of diffusion of gases, and its mechanical application is effected by the employment of an elastic metal chamber with a bottom of porous tile, through which the diffusion takes place.

This instrument should be part of the equipment of every gas company's maintenance department. Write for prices.

Taylor Instrument Companies

ROCHESTER, N. Y., U. S. A.

CANADIAN PLANT
TYCOS BUILDING
TORONTO

MANUFACTURING DISTRIBUTORS
IN GREAT BRITAIN
SHORT & MASON, LTD., LONDON

775

TRADE CATALOGS

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NEW
ROPER GAS FIRED FURNACES

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NEW
in construction - -

NEW
in beauty - - - - -

NEW
in dependability -

NEW
in convenience!

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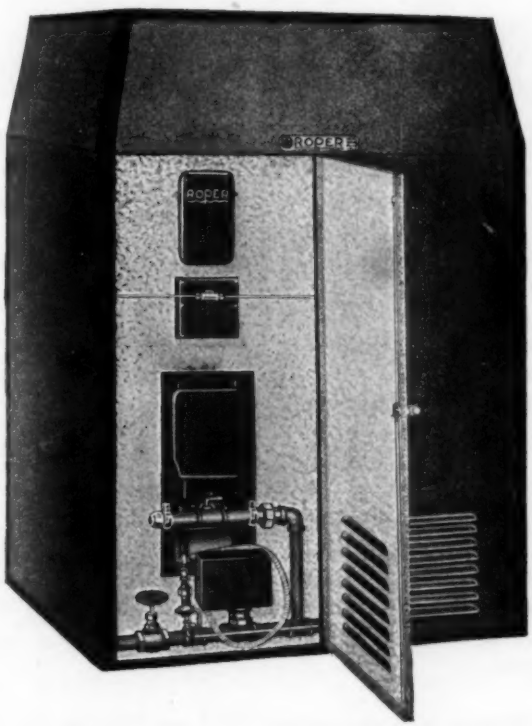

Many new great features . . . Rugged Cast-Iron heating unit for long life. Meets all exacting requirements of the American Gas Association Testing Laboratory. Neat, beautiful design, with finish bright Crystal Green. All automatic equipment concealed behind door at front of furnace. Simple to install. New construction produces greater fuel economy and prevents scorching of air circulated through the rooms. Innumerable new selling points.

Push the sale of new Roper Gas-Fired Warm Air Furnaces to increase gas consumption. Write or wire for complete information.

GEO. D. ROPER CORPORATION
Rockford, Ill.

AMERICAN GAS ASSOCIATION APPROVED — COMPLIES WITH NATIONAL SAFETY REQUIREMENTS

ROPER

GAS FURNACES

Gas Ranges—Hotel and Restaurant Equipment — Radiantfire Sheetflame Space Heaters.

Be sure the Roper purple line ═ *and the Roper complete oven control are on the gas appliance you sell.*

Type 2560 American Mercury Actuated, Air-Operated Temperature Controller for All Temperatures from Minus 40 to 1000° F.

You can actually check profits with American Temperature Controllers. Many plants in every industry have found that out. When the difference of a few degrees in temperature means spoilage, or loss of power and heat, or poor quality, or loss of time, or decreased production—then Temperature Controllers pay.

If any heating or cooling operation requires regulation, it can be done better automatically. Write us about your problems.

The American Mercury-Actuated Temperature Controller is the result of long experience in research and design. The spiral steel spring used is the same as that in American Recording Thermometers. There are no connecting levers or links—the movement of the spring being transmitted to the air valve directly, thus eliminating friction and backlash.

It is simple in construction and positive in operation. Each instrument is thoroughly tested before shipment. Accuracy is guaranteed. Short or long ranges from minus 40 to 1000° F. Accuracy is the same for any temperature within the range.

Specify Catalogs Desired

American Gas Maker's Gauge P-7
American Recording Thermometer H-7
American Temperature Controller R-7
American Recording Gauge E-7
American Glass Thermometer F-7

CONSOLIDATED ASHCROFT HANCOCK CO., INC.
Bridgeport, Conn.
Subsidiary of Manning, Maxwell & Moore, Inc.

AMERICAN INSTRUMENTS
SINCE 1851

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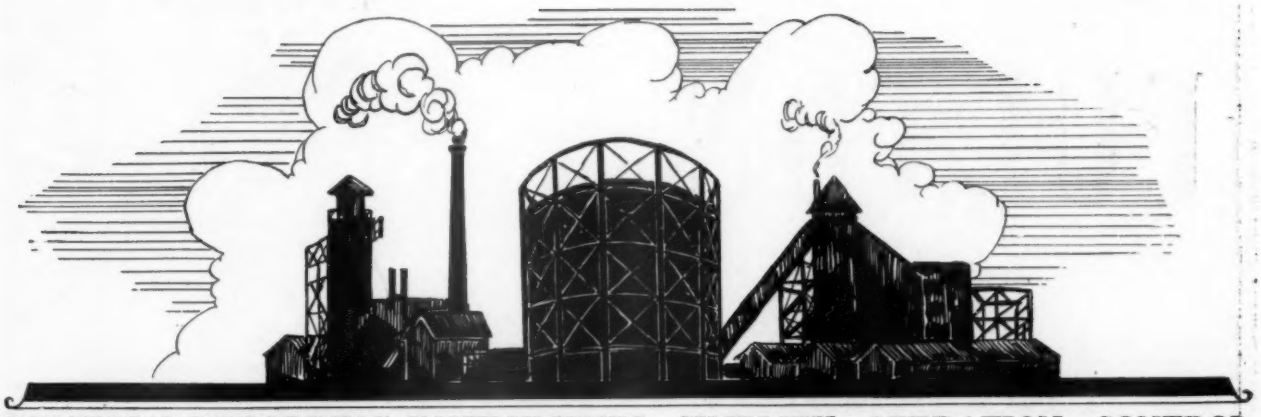

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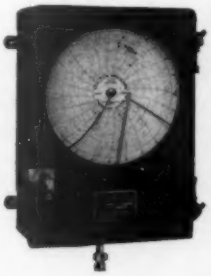

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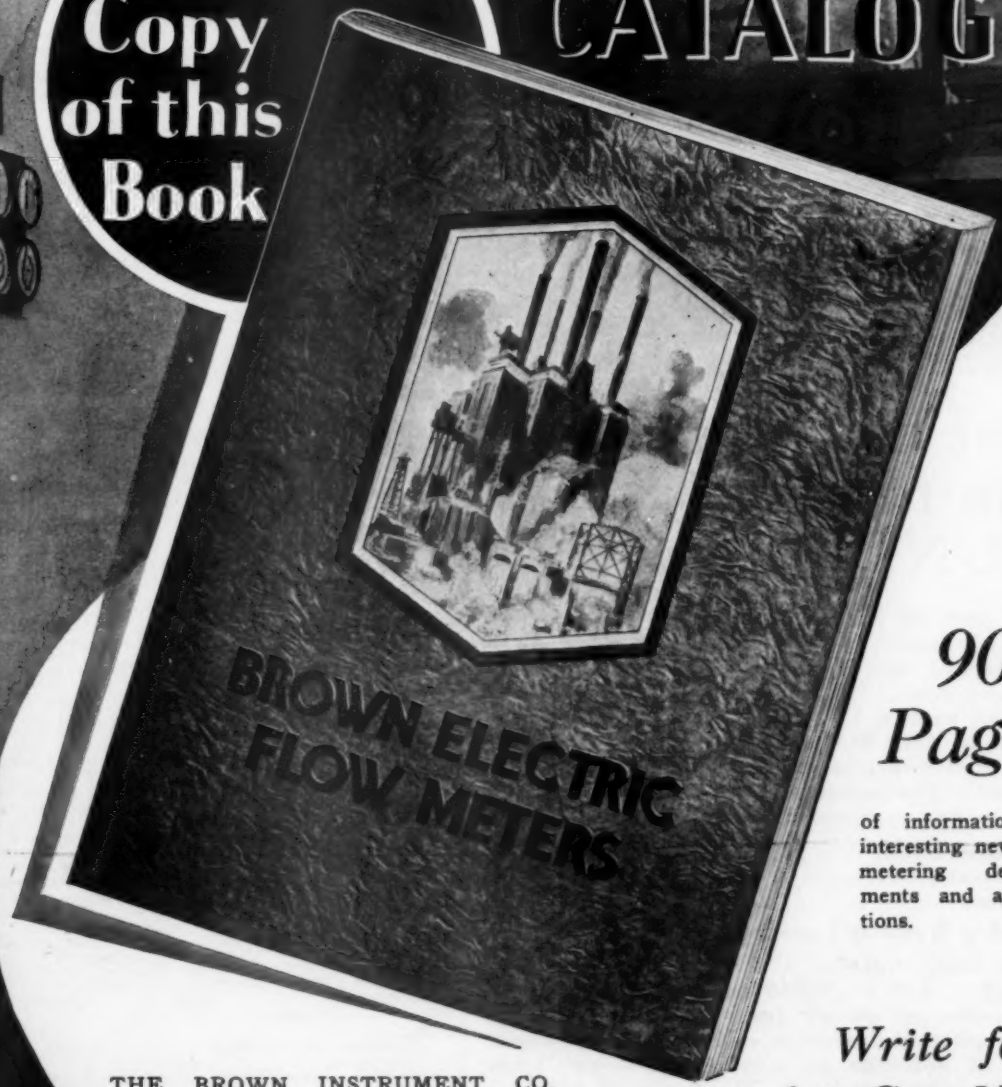

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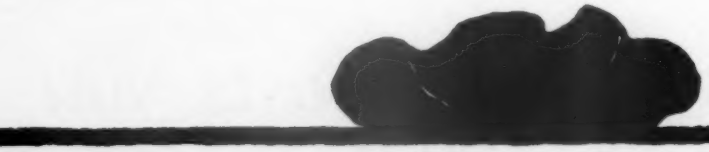

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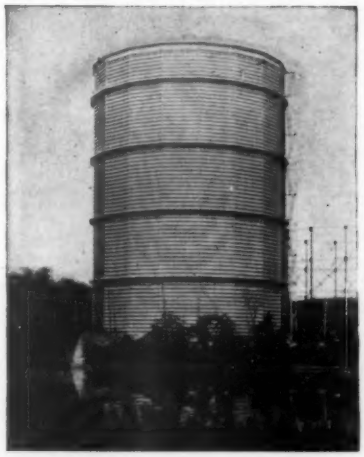

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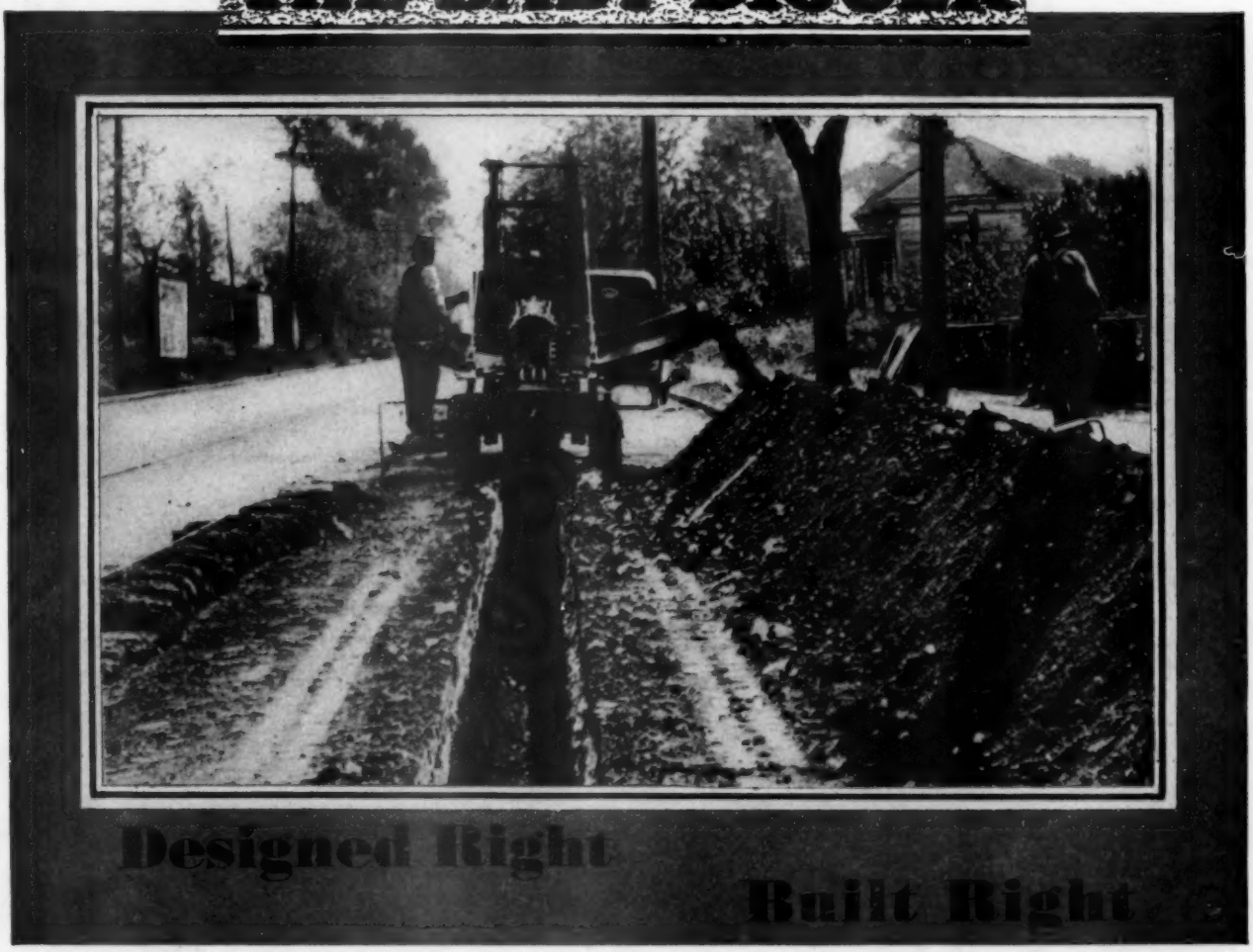

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Built into the Baby Digger are the materials, craftsmanship and ideas that make it the finest trencher that money can buy, assuring you quality that saves, and serves and satisfies.

THE CLEVELAND TRENCHER COMPANY
"Pioneers of the Small Trencher"
20100 St. Clair Ave. Cleveland, Ohio

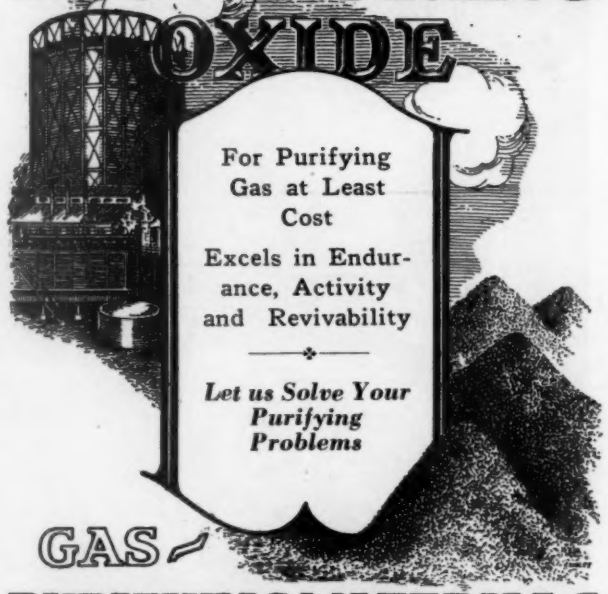
HERE'S TRUE VALUE AND ECONOMY—WORTH INVESTIGATING—WRITE TODAY FOR INFORMATION

COOLING GAS AFTER COMPRESSION

Reduces drip pumpage. Eliminates leakage from pipe expansion and contraction by stabilizing the temperature of the pipe. We build coolers to reduce gas temperatures to as close as within 5 degrees of the cold water temperature and with small cooling water requirements.

ANDALE COMPANY
1600 ARCH STREET
PHILADELPHIA

IRON BORING OXIDE



For Purifying Gas at Least Cost

Excels in Endurance, Activity and Revivability

Let us Solve Your Purifying Problems

GAS PURIFYING MATERIALS COMPANY INC.

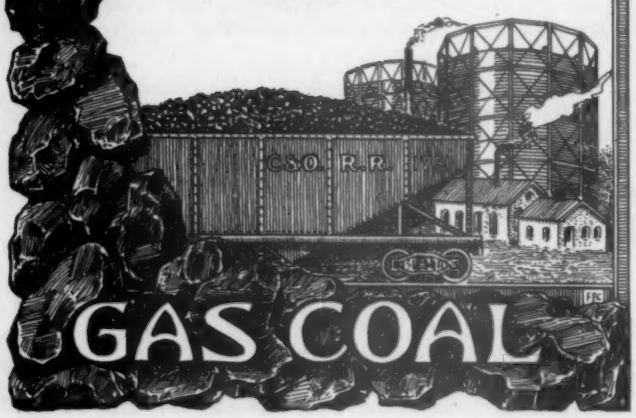
FOOT OF HALSEY STREET LONG ISLAND CITY
NEW YORK
BRANCH YARD—PROVIDENCE, R.I.

LOGAN-CHILTON

The Standard Bituminous Coal for Water and Coal Gas Manufacture

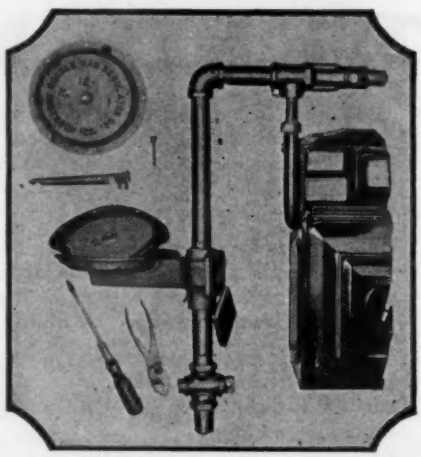
This is one of the Bituminous Coals mentioned as used successfully in the manufacture of Water Gas at the A. G. A. Production Conference, Baltimore, May 1929.

Amherst-Logan County Coal Corporation
Kanawha Valley Building,
Charleston, W. Va.



GAS COAL

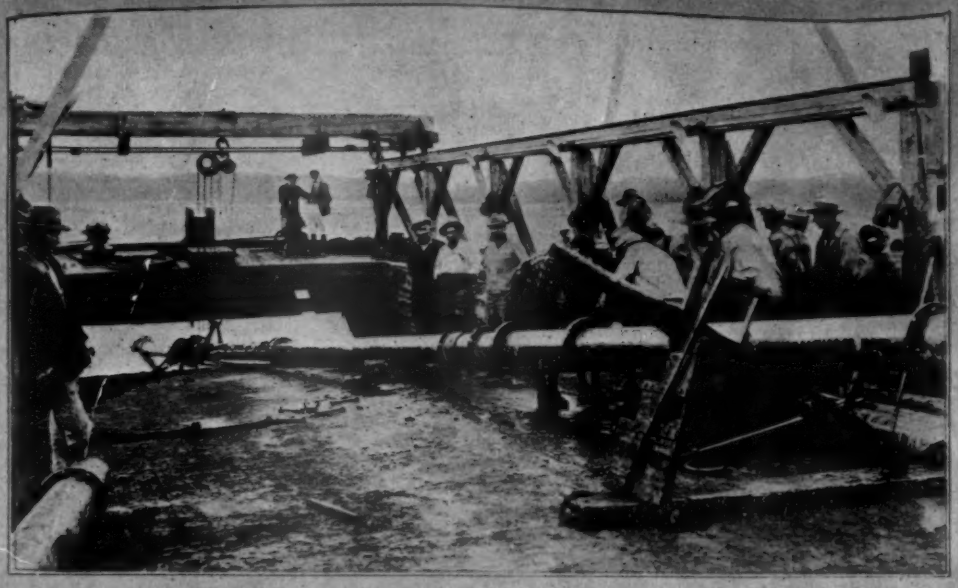
GROBLE
REGULATORS & GOVERNORS



Something To Think About

A Screwdriver and a pair of Pliers are the only tools required to make complete repairs to a GROBLE SERVICE REGULATOR while in the Service Line.

GROBLE GAS REGULATOR COMPANY
Office and Factory—Anderson, Indiana



Laying water lines at Mississippi river crossing

208 Miles of 18-Inch Gas Line in 92 Days Is Record on Memphis Project

STARTING in Louisiana, this 208-mile 18-inch gas line reached Memphis in 92 days. Laying the line involved the crossing of cotton fields, gumbo, swamps, the Mississippi and four other rivers; nine railroads; canals, ditches and bayous—about the full range of experiences that would likely be encountered in laying a pipe line anywhere.

While much credit belongs to the skill of workmen and the wise supervision of the job, still a share may go to an ever-ready and adaptable pipe whose characteristics—more particularly strength, ductility and well-finished ends, meant much in the general success of laying the line.

There is much satisfaction in knowing that when difficult installation problems are encountered which place extra strain on the pipe, such as, crossing rivers and deep ravines, that the pipe can be counted upon to meet these special conditions in a thoroughly satisfactory manner. The extensive use of NATIONAL for lines involving unusual engineering problems is substantial evidence of the reliability of this pipe for special and difficult conditions—one of the reasons why NATIONAL is

AMERICA'S STANDARD PIPE FOR GAS LINES

NATIONAL TUBE COMPANY · Pittsburgh, Pa.

Subsidiary of United States Steel Corporation

NATIONAL PIPE

ISBELL-PORTER COMPANY

Engineers and Contractors for Complete Gas Works

I-P C

Manufacturers of All Kinds of Gas Apparatus

NEWARK - NEW JERSEY

LAVINO OXIDE

Intensely Active. High Total Sulphur Absorption at Minimum Cost.

"THE EFFICIENT PURIFIER"

The Sponge with the large Tough Shavings Always Uniform

LAVINO SPONGE

E. J. LAVINO and COMPANY - BULLITT BLDG. - PHILADELPHIA, PA.

NEW YORK CHICAGO PITTSBURGH

The Quigley Gun

Speeds Refractory Repairs and Construction

The Quigley Refractory Gun shoots plastic refractory mixtures with great velocity at any place in wall, arch or baffle of furnace. It makes the material stick where hand troweled or rammed-in applications might fail to hold.

Gas Plants use the Quigley Gun to: Fill cracks or holes, Restore burned out walls, Resurface new or old walls, Repair leaky baffles, Build new baffles, etc. Booklet RG130.

HYTEMPITE

"The Standard for Comparison in High Temperature Cements"

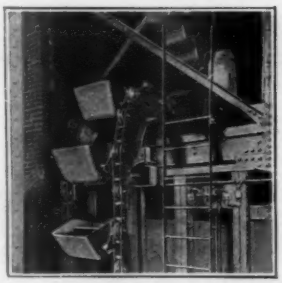
Universally used for laying up firebrick in all types of furnaces, boiler settings, arches, etc. (and when mixed with crushed old firebrick or Ganisand) for monolithic construction, baffles, patches, repairs, special shapes and tile, etc.. See booklet H109R.

QUIGLEY FURNACE SPECIALTIES COMPANY INCORPORATED

56 West 45th Street New York

REFRACTORY MATERIALS FOR FURNACE CONSTRUCTION AND MAINTENANCE
ACID PROOF CEMENTS ACID AND ALKALI PROOF COATINGS

Stock and Service through Agents in Every Industrial Center



HUNT

PIVOTED BUCKET CONVEYOR

The peculiar system of driving by pawls, of which the Hunt is the only type existent, relieves the wheel of all stress. The Hunt conveyor can assume twists impossible with a sprocket driven machine.

WE DESIGN AND BUILD:

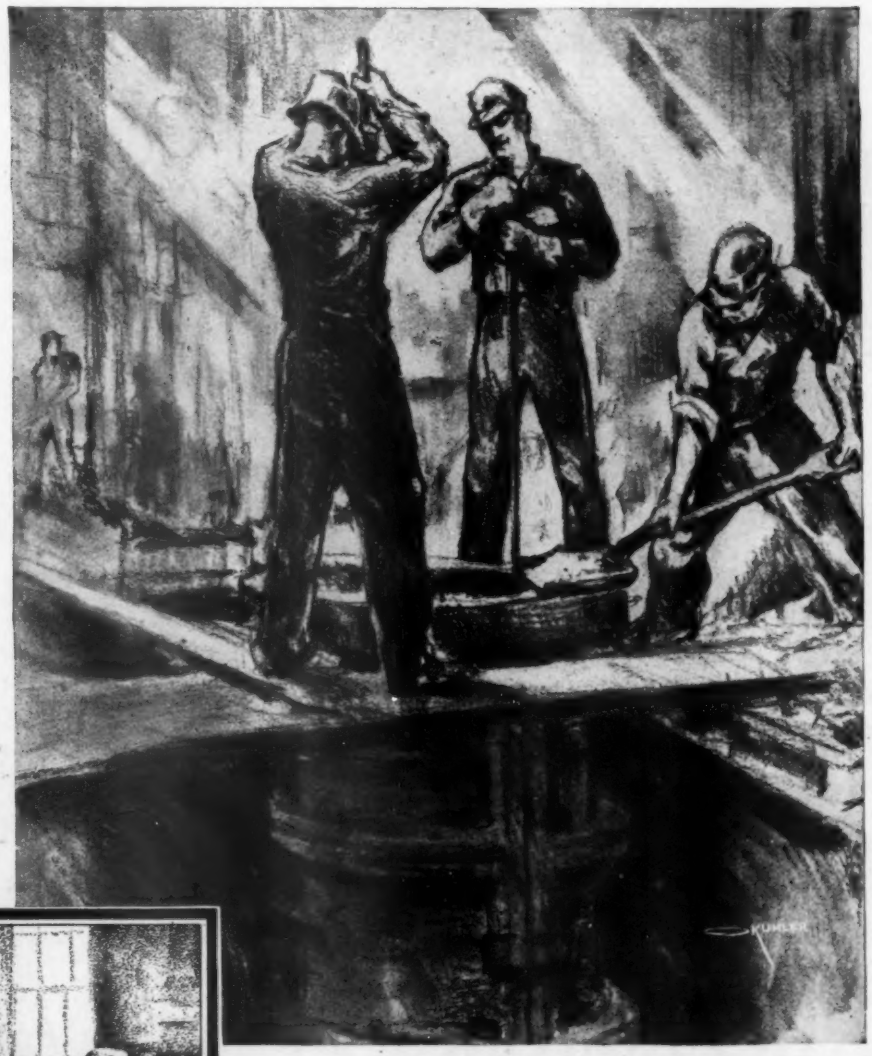
Industrial Railways, Automatic Railways, Cable Railways, Cars, Tracks, Switches, Motor Cars, Scales, Conveyors, Skip Hoists, Electric Vibrating Screens, Cut-off Valves, or Gates, Weighing and Measuring Devices, Coal Crackers, "Stevedore" Transmission Rope.

C.W.HUNT CO. Inc.

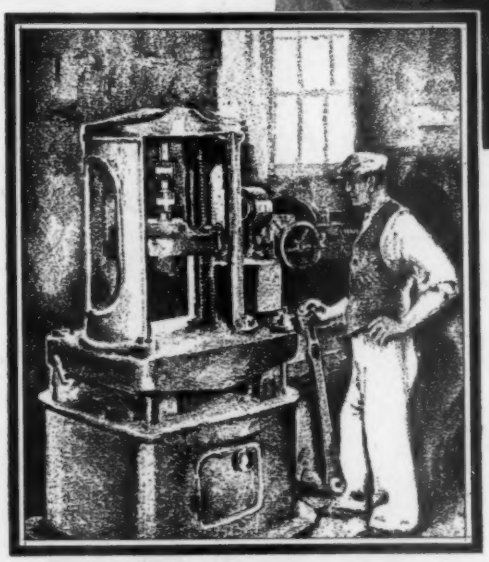
WEST NEW BRIGHTON, STATEN ISLAND, N. Y.

Chicago - Montreal - Boston

HUNT



The illustration below shows the testing of a section of cast iron pipe for tensile strength. The metal in modern cast iron pipe must show a tensile strength of 20,000 lbs. per square inch.



CAST Q IRON

The "Q-check" symbol shown above has been adopted as the trade mark of The Cast Iron Pipe Research Association. Insist on this "Q-check" mark when specifying cast iron pipe for gas, water, sewer or industrial service. For complete information write to The Cast Iron Pipe Research Association, Thomas F. Wolfe, Research Engineer, Peoples Gas Building, Chicago.

ONE of the important industrial achievements of the past two decades has been the progress of the cast iron pressure pipe industry. Today, uncertain "rules of thumb" have been superseded by laws of metallurgical science. Today, the age-defying quality and uniformity of every length of cast iron pipe is tested and checked with scientific certainty. Small wonder that modern cast iron pipe is recognized as longest-lived and most economical for water and gas mains.

* * *

The Cast Iron Pipe Research Association is a service organization of leading pipe founders, formed to promote the scientific improvement and proper use of Cast Iron Pipe. Pipe bearing the Association "Q-check" mark may be obtained from the following: American Cast Iron Pipe Co., Birmingham, Ala.; James B. Clow & Sons, 219 N. Talman Ave., Chicago, Ill.; Donaldson Iron Company, Emaus, Pa.; Glamorgan Pipe and Foundry Co., Lynchburg, Va.; Lynchburg Foundry Company, Lynchburg, Va.; National Cast Iron Pipe Company, Birmingham, Ala.; United States Pipe & Foundry Company, Burlington, N. J.; Warren Foundry and Pipe Company, 11 Broadway, New York City.

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CAST IRON PIPE

FLANGE END

VALVES

We can furnish Valves for working pressures up to 1200 lbs. per sq. in.

Send for Circular 5

The LUDLOW

VALVE MANUFACTURING COMPANY
TROY, N. Y.

New York 81 Fulton St. | Boston Tremont Bldg. | Philadelphia Harrison Building
Chicago The Rookery | Pittsburgh Oliver Bldg. | Kansas City R. A. Long Bldg.

RITER-CONLEY CO.
STEEL CONSTRUCTION
PITTSBURGH

STEEL PLATEWORK
FOR
THE GAS INDUSTRY

Gas Holders
Pressure Tanks
Steel Pipe
Steel Barges
Oil Tanks
Purifiers

BRANCH OFFICES

New York — Boston — Baltimore
Chicago — Philadelphia — Detroit
Cleveland — Cincinnati — Seattle
San Francisco — Los Angeles

LEADING GAS COMPANIES USE LAMBERT METERS

All sizes up to 3,400 cu. ft. capacity

Meters
Diaphragms
Repairs
Provers
Pumps
Calorimeters
Wet Meters
Gauges
Apparatus

LAMBERT METER CO.
BUSH TERM. BLDG. 4, BROOKLYN, N. Y.

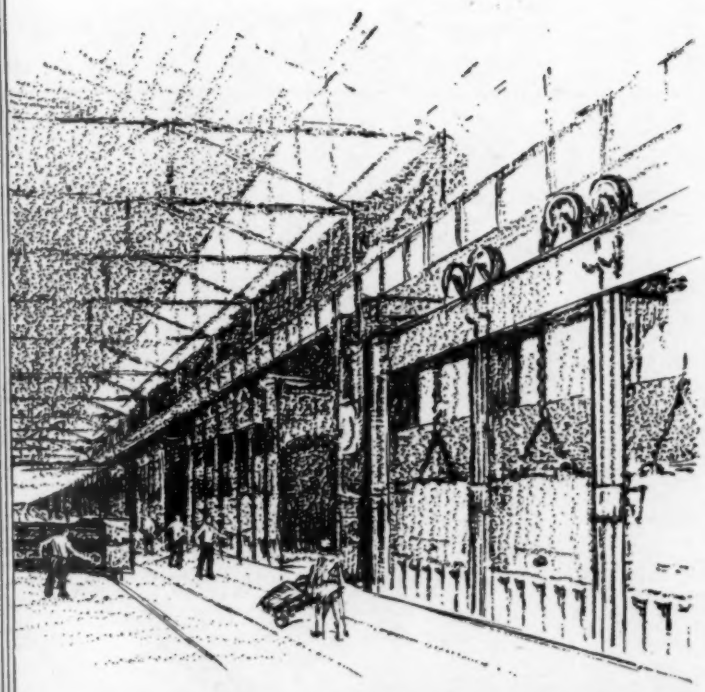
Byllesby Engineering and Management Corporation

BYLLESBY
PIONEERS IN PUBLIC SERVICE
ENGINEERING FINANCE MANAGEMENT

CHICAGO NEW YORK

Pittsburgh San Francisco

From Ore to Finished Pipe or Tube —Pittsburgh Seamless is the product of one Company's Resources and Skill . . . .



TUBE ROUNDS are *"made"* in the FURNACE

The most modern of blast furnaces and open-hearth furnaces with which our plant is equipped play an important part in the manufacture of Pittsburgh Seamless, yet these alone cannot assure the perfect tube round.

But, with more than a quarter century of "knowing how," combined with selected materials and improved modern equipment—we cast the ingot from which Pittsburgh Seamless draws its quality—with perfect assurance that the result will fully measure up to the standard established for "Pittsburgh" products.

Casing
Oil Well Tubing
Drill Pipe
Line Pipe

Sizes ½" to 14" O.D., *Lengths up to 45 feet,* depending on Size and Wall Thickness.

Pittsburgh Steel Products Co.

DIVISION OF Pittsburgh Steel Co.

Pittsburgh New York Chicago Detroit St. Louis Houston Tulsa

Pittsburgh Seamless

2907

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See page 117 for advertisements of these products

A B. C. SELF CLINKERING GRATES
The Western Gas Construction Company.

ACCUMULATORS—STEAM
The Gas Machinery Co.
Ruth's Steam Accumulator Co.
A. O. Smith Corp.
Smoot Engineering Corp.
The Western Gas Construction Company.
United Engineers & Constructors, Inc.

ACETYLENE
The Prest-O-Lite Co., Inc.
Oxweld Acetylene Co.

ACETYLENE EQUIPMENT
American Lava Corp.

ACCOUNTING MACHINES
Remington Rand, Inc.

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Bartlett Hayward Co.
Cruse-Kemper Co.
The Gas Machinery Co.
Isbell-Porter Company.
Semet-Solvay Engineering Corp.
The Stacey Mfg. Co.
John S. Unger.
The Western Gas Construction Company.

AMMONIA CONCENTRATED LIQUOR PLANTS
The Gas Machinery Co.
Semet-Solvay Engineering Corp.

AMMONIA PIPE
National Tube Company.

AMMONIA RECOVERY APPARATUS
The Koppers Construction Co.
Semet-Solvay Engineering Corp.
The Western Gas Construction Company.

AMMONIA STILLS
Bartlett-Hayward Co.
Cruse-Kemper Co
The Gas Machinery Co.
Isbell-Porter Company.
The Koppers Construction Co.
Semet-Solvay Engineering Corp.
The Stacey Mfg. Co.
John S. Unger.
The Western Gas Construction Company.

AMMONIA TEST
American Meter Co.

APPRAISALS & INVENTORIES
Stacey Bros. Gas Construction Co.
United Engineers & Constructors, Inc.

APPARATUS
Laboratory Experimental
American Meter Co.
Service
American Meter Co.

ASH STORAGE BINS
C. W. Hunt Co., Inc.
Semet-Solvay Engineering Corp.
Riter-Conley Co.
The Stacey Mfg. Co.

AUDITS
United Engineers & Constructors, Inc.

AUTOMATIC CONTROLS FOR WATER GAS APP
The Brown Instrument Co.
United Engineers & Constructors, Inc.

AUTOMATIC RAILWAYS
C. W. Hunt Co., Inc.

BACK PRESSURE VALVES
Connelly Iron Sponge & Governor Co.

BACKRUN GAS EQUIPMENT
Semet-Solvay Engineering Corp.

BAGS
Safety Gas Main Stopper Co.

BAROMETERS
Connelly Iron Sponge & Governor Co.
Consolidated Ashcroft Hancock Co., Inc.
Precision Thermometer & Instrument Company.
Taylor Instrument Companies

BENCHES
Improved Equipment-Russell Engineering Corp.
Isbell-Porter Company.
The Gas Machinery Co.
The Stacey Mfg. Co.
United Engineers & Constructors, Inc.
The Western Gas Construction Company.

BENZOL
Bartlett-Hayward Co.
Indugas, Inc.
The Koppers Construction Co.

BENZOL RECOVERY PLANTS
Semet-Solvay Engineering Corp.

BLOWERS
Connersville Blower Co., The.
Gas Engineering Co.
The Gas Machinery Co.
Pittsburgh Equitable Meter Co.
The P. H. & F. M. Roots Company.
United Engineers & Constructors, Inc.
The Western Gas Construction Company.

BLUE GAS PLANT
Bartlett-Hayward Co.
Indugas, Inc.
Gas Engineering Co.
Semet-Solvay Engineering Corp.
The Stacey Mfg. Co.
United Engineers & Constructors, Inc.
The Western Gas Construction Company.

BOILERS (GAS FIRED)
P. M Lattner Mfg. Co.

BOILERS—WASTE HEAT
Bartlett-Hayward Co.
Combustion Engineering Corpn.
Improved Equipment-Russell Engineering Corp.
Isbell-Porter Company.
United Engineers & Constructors, Inc.
West Gas Improvement Co.
The Western Gas Construction Company.

BOOKKEEPING MACHINES
Remington Rand, Inc.

BOOSTERS
Connelly Iron Sponge & Governor Co.
Connersville Blower Co., The

BRICK
Fire and Checker
Botfield Refractories Co.
The Gas Machinery Co.
General Refractories Co.
Improved Equipment Co.-Russell Eng. Corp.
United Engineers & Constructors, Inc.
United States Refractories Corp.
Silica
The Gas Machinery Co.
Improved Equipment-Russell Engineering Corp.
E. J. Lavino & Company.
United States Refractories Corp.

BRUSHES, PIPE CLEANING
Safety Gas Main Stopper Co.

B. T. U. INDICATORS
Alpha-Lux Co.

BUILDINGS
United Engineers & Constructors, Inc.

BURNERS (Industrial)
American Lava Corp.
The C. M. Kemp Mfg. Co.
Conversion
Cleveland Gas Burner & Appliance Co.
Conversion House Heating
Roberts Gas Burner Corp.
Fuel
Cleveland Gas Burner & Appliance Co.

BY-PRODUCT COKE
Semet-Solvay Co.

BY-PRODUCT PLANTS
Bartlett-Hayward Co.
Indugas, Inc.
The Gas Machinery Co.
International Coal Carbonization Co
The Koppers Construction Co.
Semet-Solvay Engineering Corp.
The Stacey Mfg. Co.
West Gas Improvement Co.

CABLE RAILWAYS
C. W. Hunt Co., Inc.
Alpha-Lux Company.
American Meter Co.
Consolidated Ashcroft Hancock Inc., Co.

CALORIMETERS
John J. Griffin & Company.

CALORIMETER ACCESSORIES
American Meter Co.

CARBIDE
Union Carbide Sales Co.

CARBONIZATION
The Gas Machinery Co.
Low Temperature
International Coal Carbonization Co.

CARBURETTED WATER GAS
The Western Gas Construction Co.

CARBURETTED WATER GAS PLANTS
Bartlett-Hayward Co.
The Gas Machinery Co.
Semet-Solvay Engineering Corp.
The Stacey Mfg. Co.
United Engineers & Constructors, Inc.

CARS
C. W. Hunt Co., Inc.

CASINGS, SEAMLESS STEEL
National Tube Co.

CAST IRON PIPE
Bell
Cast Iron Pipe Research Ass'n.
Spigot
Cast Iron Pipe Research Ass'n.

CEMENTS
Acid-proof
Botfield Refractories Company.
General Refractories Co.
Quigley Furnace Spec. Co., Inc.
Firebrick
Botfield Refractories Company.
General Refractories Co.
Improved Equipment-Russell Engineering Corp.
United States Refractories Corp.
High Temperature
Alpha-Lux Company.
Botfield Refractories Company.
General Refractories Co.
E. J. Lavino & Co.
Quigley Furnace Spec. Co., Inc.
United States Refractories Corp.
Refractory
Botfield Refractories Company.
General Refractories Co.
Improved Equipment-Russell Engineering Corp.
E. J. Lavino & Co.
United States Refractories Corp.

CHAMBER OVENS
United Engineers & Constructors, Inc.

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Bartlett-Hayward Co.
The Gas Machinery Co.
Improved Equipment-Russell Engineering Corp.
Isbell-Porter Company.
Semet-Solvay Engineering Corp.
The Western Gas Construction Company.

CHUTES
C. W. Hunt Co., Inc.
Riter-Conley Company
Robins Conveying Belt Co.
Semet-Solvay Engineering Corp.
The Stacey Mfg. Co.

CLAMPS (PIPE)
S. R. Dresser Mfg. Co.

CLOCKS & WATCHES, Stop
American Meter Co.

COALS
Boone County Coal Corpn.
Logan County Coal Corp.
Westmoreland Coal Co

COAL GAS APPARATUS
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Indugas, Inc.
The Gas Machinery Co.
Improved Equipment-Russell Engineering Corp.
Isbell-Porter Company.
The Koppers Construction Co.
Semet-Solvay Engineering Corp.
The Stacey Mfg. Co.
United Engineers & Constructors, Inc.
West Gas Improvement Company.
The Western Gas Construction Company.

COAL & COKE BINS CASTINGS
The Koppers Construction Co.
The Stacey Mfg. Co.

COAL AND COKE HANDLING MACHINERY
Bartlett-Hayward Co.
Dry Quenching Equipment Corp.
C. W. Hunt Co., Inc.
Isbell-Porter Company.
The Koppers Construction Co.
Semet-Solvay Engineering Corp.
United Engineers & Constructors Inc.

COAL TAR PRODUCTS
International Combustion, Tar, and Chemical Corpn.
The Koppers Construction Co.
Semet-Solvay Engineering Corp.

COAL TUBES
C. W. Hunt Co., Inc.
Meter
American Meter Co.
Superior Meter Co.
Service
American Meter Co.

COKE CRUSHERS
The Koppers Construction Co.

COKE QUENCHING
Dry Quenching Equipment Corp.
The Koppers Construction Co.
Semet-Solvay Engineering Corp.

COKE RECLAMATION SYSTEMS
C. W. Hunt Co., Inc.

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Heating Value
United Engineers & Constructors, Inc.

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Cruse-Kemper Co.
Gas Engineering Co.
The Gas Machinery Co.
Isbell-Porter Company.
Semet-Solvay Engineering Corp.
The Stacey Mfg. Co.
The Western Gas Construction Company.
High Duty
Stacey Bros. Gas Const. Co.
United Engineers & Constructors, Inc.

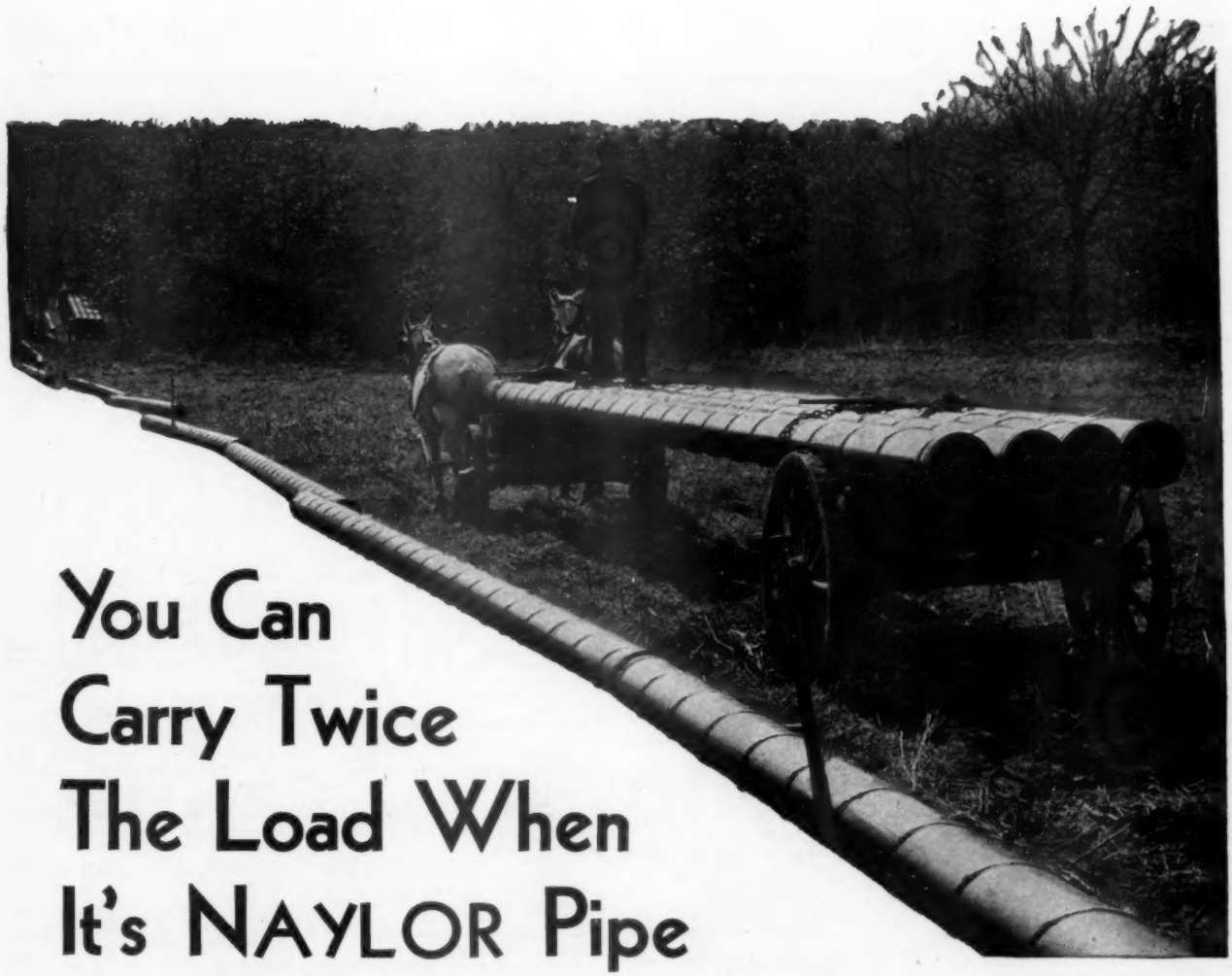
CONTRACTORS' TUBS
C. W. Hunt Co., Inc.

CONTROLS
The Bristol Company.
The Brown Instrument Co.
Robertshaw Thermostat Co.
Time-O-Stat Controls Co.
Combustion
Smoot Engineering Corp.
Gas Pressure
Smoot Engineering Corp.
Gas Producer
Smoot Engineering Corp.
Hot Water Heat System
The Cleveland Heater Company.
Water Gas Machine
Smoot Engineering Corp.

CONVEYORS
C. W. Hunt Co., Inc.
Isbell-Porter Company.
The Koppers Construction Co.

COOLERS
The Gas Machinery Co.
Semet-Solvay Engineering Corp.
The Western Gas Construction Company.
Air
Andale Company.
Ammonia Liquor
Andale Company.
Gas
Andale Company.
Oil
Andale Company.

COOLING COILS
The Gas Machinery Co.
Semet-Solvay Engineering Corp.
The Western Gas Construction Company.



You Can Carry Twice The Load When It's NAYLOR Pipe

ON this job four forty foot lengths of ten inch Naylor Pipe make a wagon load. With ordinary wrought pipe only two lengths could be carried.

Due to its unique, electric welded spiral lock-seam structure, Naylor Pipe is the lightest pressure pipe you can buy. It carries the same pressures as standard weight wrought pipe, yet weighs only about half as much.

Particularly where going is difficult this weight saving means a time saving and a haulage saving.

Naylor Pipe saves one-third and more in pipe laying costs, and then keeps on saving, for Toncan Iron has a superior resistance to rust and corrosion that makes Naylor Pipe last longer.

Many miles of Naylor Pipe are now proving their economy in pipe line service, conveying oil, gas and water.

NAYLOR PIPE COMPANY

Main Office and Plant, 1230 East 92nd Street, Chicago

Sales Offices:

New York, 25 Church Street
Philadelphia, Witherspoon Building
Detroit, 1500 Cadillac Sq. Bldg
Tulsa, 507 Philtower Building

DUCOMMUN CORPORATION

Los Angeles
San Francisco

Exclusive Distributors:

California
Arizona
Nevada and Utah

Montreal, Canada: Mechanical Equipment Company, New Birks Building

TONCAN
Naylor Pipe
Mo-lyb-den-um
IRON

Standardized Naylor Pipe is made in sizes 6" to 12" I. D. and 14" to 20" O. D. in any uniform length desired up to 40' 0". Ends made to wrought pipe standards for all types of coupling.

Where corrosion resistance is not a factor, Naylor Pipe can be furnished in steel.

Toncan Copper Molybdenum Iron is a development of Central Alloy Steel Corporation, the world's largest and most highly specialized alloy steel producers. It possesses a superior corrosion resistance, making it the favored pipe material.

Buyers' Reference Index

See page 117 for advertisements of these products

COUPLINGS
Bartlett-Hayward Co.
S. R. Dresser Mfg. Co.
National Tube Co.
Pittsburgh Equitable Meter Co.
The P. H. & F. M. Roots Company.
Victaulic Co. of Amer.

COUPLINGS—FLEXIBLE
The P. H. & F. M. Roots Company.

CUBIC FOOT BOTTLES
Superior Meter Co.

CUTTING APPARATUS & SUPPLIES
Union Carbide & Carbon Co.

CRUSHERS
Riter-Conley Company.

CUBIC FOOT BOTTLES
American Meter Co.
Lambert Meter Co.

DE-EMULSIFIERS
Semet-Solvay Engineering Corp.
The Western Gas Construction Company.

DEHYDRATORS, GAS
Andale Company.
Semet-Solvay Engineering Corp.
West Gas Improvement Co.
The Western Gas Construction Company.

DEMONSTRATION METERS
Lambert Meter Co.

DIAPHRAGMS (Meter)
Lambert Meter Co.
Superior Meter Co.
American Meter Co.

DISCHARGING MACHINERY
Bartlett-Hayward Co.
Improved Equipment-Russell Engineering Corp.
Semet-Solvay Engineering Corp.

DRAFT GAUGES
Brown Instrument Co., The
Consolidated Ashcroft Hancock Co., Inc.
Precision Thermometer & Instrument Company.
Taylor Instrument Companies.

DRYERS (Laundry)
W. E. Lamneck Co.

ELECTRIC LOCOMOTIVES
C. W. Hunt Co., Inc.

ELEVATORS
C. W. Hunt Co., Inc.
Craig Ridgway & Son Co.
Robins Conveying Belt Co.

ENGINE INDICATORS
Consolidated Ashcroft Hancock Co., Inc.

ENGINEERS
American Meter Co.
The Gas Machinery Co.
Combustion
Bartlett-Hayward Co.
The C. M. Kemp Mfg. Co.
Smoot Engineering Corp.
United Engineers & Constructors, Inc.
Consulting
Bartlett-Hayward Co.
Edw. A. Dieterle
United Engineers & Constructors, Inc.
George H. Waring.
The Western Gas Construction Company.
Contracting
Bartlett-Hayward Co.
Cruse-Kemper Co.
Gas Engineering Company.
C. W. Hunt Co., Inc.
Isbell-Porter Company.
Riter-Conley Company.
Stacey Gros. Gas Const. Co.
United Engineers & Constructors, Inc.
West Gas Improvement Co.
The Western Gas Construction Company.
Distribution
United Engineers & Constructors, Inc.
Measurement
American Meter Co.

EXHAUSTERS
Connersville Blower Co., The
The Gas Machinery Co.
Isbell-Porter Company.
The P. H. & F. M. Roots Company.
The Western Gas Construction Company.

EXPANSION BENDS
The Gas Machinery Co.
Semet-Solvay Engineering Corp.

FILES (Steel and Wood)
Remington Rand, Inc.

FILES (Visible)
Remington Rand, Inc.

FILTERS, Gas
American Meter Co.

FIREBRICK, CEMENT
General Refractories Co.
Quigley Furnace Specialties Co., Inc.

FIREBRICK CHECKER BRICK (See Brick)
Botfield Refractories Company.
The Gas Machinery Co.
General Refractories Co.
Improved Equipment-Russell Engineering Corp.
United Engineers & Constructors, Inc.
The Western Gas Construction Company.

FIRST AID EQUIPMENT
United Engineers & Constructors, Inc.

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Semet-Solvay Engineering Corp.
The Stacey Mfg. Co.
U. S. Cast Iron Pipe and Foundry Co.
The Western Gas Construction Company.
Plain End and Flanged
Cast Iron Pipe Research Association.

FIXTURES
American Lava Corp.

FLOORS, IRON, BRICK, AND STEEL
The Gas Machinery Co.
Riter-Conley Company.
Semet-Solvay Engineering Corp.
United Engineers & Constructors, Inc.
The Western Gas Construction Company.

FLOW METERS
Brown Instrument Co., The
Lambert Meter Co.

FLUE PIPE (Cast Iron Oval)
Semet-Solvay Engineering Corp.

FURNACES
Combustion Engineering Corpn.
Gas Fired
The C. M. Kemp Mfg. Co.
Gas Soldering
American Meter Co.

GAS ANALYSIS APPARATUS
Metric Metal Works.

GASKETS
American Meter Co.
Consolidated Ashcroft Hancock Co., Inc.
Pittsburgh Equitable Meter Co.
Superior Meter Co.

GAS COAL
Boone County Coal Corpn.

GASOMETERS (Test)
American Meter Co.

GAS PLANTS, COMPLETE
Indugas, Inc.
Gas Engineering Co.
Isbell-Porter Company.
United Engineers & Constructors, Inc.
West Gas Improvement Co.

GASSING MACHINE
American Meter Co.
Lambert Meter Co.
Superior Meter Co.

GAS TAPE
Connelly Iron Sponge & Governor Co.

GAS TESTING APPARATUS
Metric Metal Works.

GATE VALVES (See Valves)

GATES—WIND & BLAST
The P. H. & F. M. Roots Company.

GAUGE BOARDS
The Bristol Company.
Brown Instrument Co., The
Connelly Iron Sponge & Governor Co.
The Gas Machinery Co.
Lambert Meter Co.
United Engineers & Constructors, Inc.
The Western Gas Construction Company.

GAUGES
American Meter Co.
The Bristol Company.
Brown Instrument Co., The
Connelly Iron Sponge & Governor Co.
The Gas Machinery Co.
Lambert Meter Co.
Maryland Meter Co.
Metric Metal Works.
Pittsburgh Equitable Meter Co.
The P. H. & F. M. Roots Company.
Superior Meter Co.
Taylor Instrument Companies.
Tagliabue Mfg. Co., C. J.
The Western Gas Construction Company.
Mercury
Precision Thermometer & Instrument Company.
Pressure-Recording
Consolidated Ashcroft Hancock Co., Inc.
D. McDonald & Co.
Precision Thermometer & Instrument Company.
Tagliabue Mfg. Co., C. J.
Siphon
Precision Thermometer & Instrument Company.
Tank
Precision Thermometer & Instrument Company.
Water
Precision Thermometer & Instrument Company.

GLOVES
Rubber
Safety Gas Main Stopper Co.

GOVERNORS
Pittsburgh Equitable Meter Co.
Automatic
The Chaplin Fulton Mfg. Co.
Connelly Iron Sponge & Governor Co.
Gas Industries Laboratories.
Groble Gas Regulator Co.
Reynolds Gas Regulator Co.
Smoot Engineering Corp.
The Sprague Meter Co.

GOVERNORS (Calorimeter and Double Dry)
American Meter Co.
Coke Oven
The Chaplin Fulton Mfg. Co.
Connelly Iron Sponge & Governor Co.
The Gas Machinery Co.
Reynolds Gas Regulator Co.
Smoot Engineering Corp.
District
The Chaplin Fulton Mfg. Co.
Connelly Iron Sponge & Governor Co.
Groble Gas Regulator Co.
Helme & McIlhenny.
Isbell-Porter Co.
Smoot Engineering Corp.
Exhauster
Connelly Iron Sponge & Governor Co.
Connersville Blower Co., The
The Gas Machinery Co.
Isbell-Porter Co.
The P. H. & F. M. Roots Company.
Smoot Engineering Corp.
High Pressure
The Chaplin Fulton Mfg. Co.
Connelly Iron Sponge & Governor Co.
Groble Gas Regulator Co.
Reynolds Gas Regulator Co.
Smoot Engineering Corp.
The Sprague Meter Co.
Laboratory
American Meter Co.
Connelly Iron Sponge & Governor Co.
Lambert Meter Co.
D. McDonald & Co.
Reynolds Gas Regulator Co.
Low Pressure
The Chaplin Fulton Mfg. Co.
Connelly Iron Sponge & Governor Co.
Groble Gas Regulator Co.
Lambert Meter Co.
Reynolds Gas Regulator Co.
Smoot Engineering Corp.
The Sprague Meter Co.
Retort House
Isbell-Porter Company.
Station
Helme & McIlhenny.

GRATES for Water Gas Generators
Semet-Solvay Engineering Corp.

GRAVITOMETERS
Precision Thermometer & Instrument Company.

GRIDS, for Scrubbers
Semet-Solvay Engineering Corp.

HEATERS
Feed Water
Andale Company.
House
American Gas Products Corp.
American Stove Company.
Homestead Heater Company.
Welsbach Company.
The Cleveland Heater Company.
Humphrey Company.
Kompak Company.
Welsbach Company.
Pittsburg Water Heater Co.

HIGH CAPACITY METERS
Lambert Meter Co.

HIGH PRESSURE PIPE LINES
The Western Gas Construction Company.

HOISTS
The Gas Machinery Co.
C. W. Hunt Co., Inc.

HOLDERS
Bartlett-Hayward Co.
Cruse-Kemper Co.
Gas Engineering Co.
Riter-Conley Company.
Stacey Bros. Gas Const. Co.
The Stacey Mfg. Co.

HOPPERS—COAL AND COKE
Bartlett-Hayward Co.
Cruse-Kemper Co.
C. W. Hunt Co., Inc.
Riter-Conley Company.
The Stacey Mfg. Co.

HOTELS
Shelburne Hotel.

HOWARD AUTOMATIC CHARGERS
The Western Gas Construction Company.

HYDROGEN GAS APPARATUS
Bartlett-Hayward Co.
Gas Engineering Co.
Improved Equipment-Russell Engineering Corp.
Semet-Solvay Engineering Corp.
The Stacey Mfg. Co.
United Engineers & Constructors, Inc.

HYDROGEN SULPHITE TEST (Apparatus)
American Meter Co.

HYDROMETERS
The Brown Instrument Co.
Precision Thermometer & Instrument Company.
Taylor Instrument Companies.

INCINERATORS, GAS-FIRED
Kernit Incinerator Co.

INDUSTRIAL GAS MIXERS
The C. M. Kemp Mfg. Co.
Roberts Gas Burner Corp.
Smoot Engineering Corp.

INDUSTRIAL TRACK
C. W. Hunt Co., Inc.

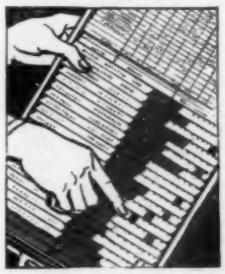
IRON BORING OXIDE
Gas Purifying Materials Co., Inc.

IRON SPONGE
Connelly Iron Sponge & Governor Co.

INSTRUMENTS
Alpha-Lux Company.
The Bristol Company.
Brown Instrument Co., The
Consolidated Ashcroft Hancock Co., Inc.
Lambert Meter Co.
Metric Metal Works.
Precision Thermometer & Instrument Company.
Taylor Instrument Companies.
Time-O-Stat Controls Co.

No Customer Ever Leaves this Counter with a Grievance

SERVICE observers of a mid-west utility reported that most customer complaints were traceable to faulty records. Flagrant cases of record errors were found in the Service Application Department. Mistakes in addresses and account numbers ... duplications ... misspelled names.



Remington Rand was asked to help. Their Representative, a public utility accounting specialist, completed an exhaustive survey ... suggested a remedy.

The new system brought order out of chaos. *Record control* was established for the service, credit and collection departments. Service to customers speeded up ... time and labor saved ... errors reduced to a minimum ... credit losses stemmed.

Remington Rand maintains a staff of specialists who are qualified by long experience to assist public service companies in solving any sort of record-keeping problems. Their services are yours for the asking—without cost or obligation.

Public Utility Department

Remington Rand

BUSINESS SERVICE

BUFFALO, NEW YORK

Buyers' Reference Index

See page 117 for advertisements of these products

Recording
American Meter Co.

JOINTS (Pipe)
S. R. Dresser Mfg. Co.
U. S. Cast Iron Pipe & Foundry Co.
Insulating
United Engineers & Constructors, Inc.
Victaulic Co. of Amer.

JOINT RUNNERS
Safety Gas Main Stopper Co.

LAMP POSTS
General Gas Light Co.

LAUNDRY EQUIPMENT
W. E. Lamneck Co.

LAVA BURNER GRIDS
American Lava Corp.

LAVA PILOT TIPS
American Lava Corp.

LINING—REFRACTORY
(See Refractory Linings

LOCKERS
Remington Rand Co.

LOOSE LEAF EQUIPMENT
Remington Rand Co.

LUX MATERIAL
Alpha-Lux Company.

LUX SPONGE
Alpha-Lux Company.

MANILA AND WIRE ROPE
C. W. Hunt Co., Inc.

MANOMETERS
Brown Instrument Co., The
Precision Thermometer & Instrument Company.

MANTLES
General Gas Light Co.
Welsbach Company.

MASKS—GAS
Safety Gas Main Stopper Co.

MAST & GAFF OUTFITS
C. W. Hunt Co., Inc.

MEASURING CHUTES
C. W. Hunt Co., Inc.

MECHANICAL GENERATORS for Water Gas App.
United Engineers & Constructors, Inc.

METER CONNECTIONS
American Meter Co.
Bartlett-Hayward Co.
S. R. Dresser Mfg. Co.
Lambert Meter Co.
D. McDonald & Co.
Maryland Meter Works.
Pittsburgh Equitable Meter Co.
Superior Meter Co.
Nathaniel Tufts Meter Works.

METER REPAIRING
Lambert Meter Co.
Superior Meter Co.

METER TESTER, Hydro-Pneumatic
American Meter Co.

METERS
Brown Instrument Co., The
Pittsburgh Equitable Meter Co.
Air
American Meter Co.
Connersville Blower Co., The
The Gas Machinery Co.
Lambert Meter Co.
D. McDonald & Co.
Metric Metal Works.
The P. H. & F. M. Roots Company.
The Sprague Meter Co.
Superior Meter Co.
Nathaniel Tufts Meter Works.
United Engineers & Constructors Inc.
The Western Gas Construction Company.
Artificial
American Meter Co.
Connersville Blower Co., The
Helme & McIlhenny.
Lambert Meter Co.
Maryland Meter Works.
D. McDonald & Co.
Metric Metal Works.
The P. H. & F. M. Roots Company.
The Sprague Meter Co.
Superior Meter Co.
Nathaniel Tufts Meter Works.
Demand
American Meter Co.
Connersville Blower Co., The
John J. Griffin & Company.
Lambert Meter Co.
D. McDonald & Co.
The P. H. & F. M. Roots Company.
Superior Meter Co.
Demonstration
American Meter Co.
Dry
Superior Meter Co.
American Meter Co.
John J. Griffin & Company.
Lambert Meter Co.
Maryland Meter Works.
D. McDonald & Co.
Metric Metal Works.
The P. H. & F. M. Roots Company.
The Sprague Meter Co.
Superior Meter Co.
Nathaniel Tufts Meter Works.
Exhibition
American Meter Co.
Natural Gas
American Meter Co.
Connersville Blower Co., The
John J. Griffin & Company.
Helme & McIlhenny.
Lambert Meter Co.
Maryland Meter Works.
D. McDonald & Co.
Metric Meter Works.
The P. H. & F. M. Roots Company.
The Sprague Meter Co.
Superior Meter Co.
Oil
American Meter Co.
Connersville Blower Co., The
The Gas Machinery Co.
Orifice
American Meter Co.
Positive
The Sprague Meter Co.
Prepayment
American Meter Co.
John J. Griffin & Company.
Maryland Meter Works.
D. McDonald & Company.
Metric Metal Works.
The Sprague Meter Co.
Superior Meter Co.
Nathaniel Tufts Meter Works.
Proportional
The P. H. & F. M. Roots Company.
Station
American Meter Co.
Connersville Blower Co., The
John J. Griffin & Company.
Maryland Meter Works.
D. McDonald & Co.
Metric Metal Works.
The P. H. & F. M. Roots Company.
Nathaniel Tufts Meter Works.
The Western Gas Construction Company.
Steam
American Meter Co.
The Gas Machinery Co.
United Engineers & Constructors, Inc.
The Western Gas Construction Company
Test
American Meter Co.
John J. Griffin & Company.
Maryland Meter Works.
D. McDonald & Company.
Metric Metal Works.
The Sprague Meter Co.
Superior Meter Co.
Nathaniel Tufts Meter Works.
Wet Test
American Meter Co.

METER LEATHER
Besse, Osborn and Odell, Inc.

MILLER GRIP PACKING
Connelly Iron Sponge & Governor Co.

MIXERS, GAS
Roberts Gas Burner Corp.
Semet-Solvay Engineering Corp.
Smoot Engineering Corp.

MOISTURE DETERMINATORS
United Engineers & Constructors, Inc.

MOTOR CARS
C. W. Hunt Co ,,Inc.

NAPHTHALENE EXTRACTORS
Bartlett-Hayward Co.
The Gas Machinery Co.
Semet-Solvay Engineering Corp.
The Western Gas Construction Company.

OFFICE FURNITURE
Remington Rand, Inc.

ORE. CHROME
E. J. Lavino & Co.

OVENS (REFL TYPE BAKE)
The Bruce McDonald Co.

OVENS—COKE AND GAS
Indugas, Inc.
The Gas Machinery Co.
Semet-Solvay Engineering Corp.
The Stacey Mfg. Co.

OXIDE
Alpha-Lux Company.
Connelly Iron Sponge & Governor Co.
Gas Purifying Materials Co., Inc.
E. J. Lavino & Co.

OXYGEN
Linde Air Products Co.

OXYGEN AND HYDROGEN METERS
Lambert Meter Co.
Superior Meter Co.

PACKING
Asbestos
Safety Gas Main Stopper Co.

PAINTS
Cheesman-Elliott Co.
Safety Gas Main stopper Co.
The Stacey Mfg. Co.
Wailes Dove-Hermiston Corp.
Metal Protective
Semet-Solvay Co.

PAINTS, ANTI ACID AND ALKALI
Cheesman-Elliott Co.
Quigley Furnace Spec. Co., Inc.

PAINTS, RUSTPROOF
Cheesman-Elliott Co.
Quigley Furnace Spec. Co., Inc.

PHOTOMETERS
Connelly Iron Sponge & Governor Co.

PILOTS-SAFETY
Time-O-Stat Controls Co.

PIPE
Waylow Pipe Co.
Hedges-Walsh-Weidner Co.
National Tube Co.
Naylor Pipe Co.
The Stacey Mfg. Co.
Bell
American Meter Co.
Semet-Solvay Engineer.ng Corp.
McWane Cast Iron Pipe Co.
Bell and Spigot
U. S. Cast Iron Pipe & Foundry Co.
Cast Iron
McWane Cast Iron Pipe Co.
U. S. Cast Iron Pipe & Foundry Co.
Flange
Semet-Solvay Engineering Corp.
U. S. Cast Iron Pipe & Foundry Co.
Screw Joint Cast Iron Pipe
McWane Cast Iron Pipe Co.
Seamless Steel
Pittsburgh Steel Products Co.
Spigot
McWane Cast Iron Pipe Co.
Semet-Solvay Engineering Corp.
A. O. Smith Corp.
Naylor Pipe Co.
Steel
Bartlett-Hayward Co.
Cruse-Kemper Co.
The Gas Machinery Co.
Naylor Pipe Co.
National Tube Co.
Pittsburgh Steel Products Co.
Riter-Conley Company.
Semet-Solvay Engineering Corp.
A. O. Smith Corp.
Spiral Welded Pipe
Naylor Pipe Co.
Welded Steel
Bartlett-Hayward Co.
Cruse-Kemper Co.
The Gas Machinery Co.
National Tube Co.
Riter-Conley Company.
Semet-Solvay Engineering Corp.
A. O. Smith Corp.

PIPE COATINGS
Wailes-Dove-Hermiston Corp.

PLANTS—GAS, COMPLETE
The Gas Machinery Co.
Improved Equipment-Russell Engineering Corp.
The Koppers Construction Co.
Stacey Bros. Gas Const. Co.
The Stacey Mfg. Co.
United Engineers & Constructors, Inc.
West Gas Improvement Co.
The Western Gas Construction Company.

PLATES
Cruse-Kemper Co.
C. W. Hunt Co., Inc.
The Stacey Mfg. Co.
The Western Gas Construction Company.
Floor
Gas Engineering Co.
The Gas Machinery Co.
Riter-Conley Company.
United Engineers & Constructors, Inc.

PLUGS, SERVICE AND MAIN
Rubber
Safety Gas Main Stopper Co.
Soft Wood
Safety Gas Main Stopper Co.

PORTABLE TEST METERS
Lambert Meter Co.
Superior Meter Co.

PRODUCER GAS PLANT
Gas Engineering Co.
The Koppers Construction Co.
Semet-Solvay Engineering Corp.
The Stacey Mfg. Co.
United Engineers & Constructors, Inc.
The Western Gas Construction Company.

PRODUCER GAS STEAM
American Meter Co.

PROVERS—Critical Flow for H. P. Field Testing
American Meter Co.

PROVERS—METER
John J. Griffin & Company.
Helme & McIlhenny.
Lambert Meter Co.
D. McDonald & Co.
Pittsburgh Equitable Meter Co
Superior Meter Co.

PUMPS
Drip
American Meter Co.
The Gas Machinery Co.
Lambert Meter Co.
D. McDonald & Co.
Gas
The P. H. & F. M. Roots Company.
Gas Bag
Safety Gas Main Stopper Co.
Hand
Lambert Meter Co.
Oil
Connersville Blower Co., The
The Gas Machinery Co.
D. McDonald & Co.
The P. H. & F. M. Roots Company.
Power
Connersville Blower Co., The
The P. H. & F. M. Roots Company.
Pressure
Connersville Blower Co., The
The P. H. & F. M. Roots Company.
Service
American Meter Co.
Lambert Meter Co.
Superior Meter Co.
Service Cleaner
American Meter Co.
John J. Griffin & Company.
Lambert Meter Co.
Safety Gas Main Stopper Co.
Superior Meter Co.
Tar
Connersville Blower Co., The
The P. H. & F. M. Roots Company.
Water
Connersville Blower Co., The
The P. H. & F. M. Roots Company.
Vacuum
American Meter Co.
Connersville Blower Co., The
The P. H. & F. M. Roots Company.

PURIFIERS
Bartlett-Hayward Co.
Cruse-Kemper Co.
Gas Engineering Co.
The Gas Machinery Co.
Isbell-Porter Company.
The Koppers Construction Co
Semet-Solvay Engineering Corp
Stacey Bros. Gas. Const. Co.
The Stacey Mfg. Co.
Riter-Conley Company.
United Engineers & Constructors Inc.
The Western Gas Construction Company.

RE-CHROME METER LEATHER

COLONIAL BRAND

8 LOGICAL REASONS

showing advantages of "COLONIAL—Re-Chrome" over bark-tanned leather

BESSE, OSBORN & ODELL INC. · COLONIAL · BRAND · BOSTON, U.S.A. · RE-CHROME METER LEATHER

1 Longer years service, hence less repairs.

2 More accurate measurement of gas. Eliminating slow and fast meters.

3 More impervious to water. Will stand a five minute boiling test.

4 Greater resistance to heat and climatic changes.

5 Stronger fibre, makes it more durable.

6 Absorbs more oil, less likely to dry out and harden.

7 More flexible, easier to fabricate, sew and crimp.

8 Eliminates "floppy" diaphragms.

This trade-mark, stamped on each New Zealand Lamb skin, is our guarantee to you that each skin has received the greatest care in its selection and tanning.

In use by some of the Largest Gas Companies in the country

We will be pleased to submit sample

BESSE, OSBORN & ODELL, INC.

51 SOUTH STREET - BOSTON, MASS.

New York—177 William Street
W. A. Smith—G. Norman Bankart, Representatives.

Tanneries: Clinton, Me. *and* Peabody, Mass.

Buyers' Reference Index

See page 117 for advertisements of these products

PURIFYING MATERIALS
Alpha-Lux Company.
Connelly Iron Sponge & Governor Co.
The Gas Machinery Co.
Gas Purifying Materials Co., Inc
The Koppers Construction Co.
E. J. Lavino & Co.

PURIFIER TRAYS
Bartlett-Hayward Co.
Connelly Iron Sponge & Governor Co.
Cruse-Kemper Co.
The Gas Machinery Co.
Semet-Solvay Engineering Corp.
Stacey Bros. Gas Const. Co.
The Stacey Mfg. Co.
United Engineers & Constructors, Inc.
The Western Gas Construction Company.

PYROMETERS
The Brown Instrument Co.
Maryland Meter Works
The Bristol Company.
The Western Gas Construction Company.
Indicating
The Gas Machinery Co.
Taylor Instrument Companies.
United Engineers & Constructors, Inc.
Radiation
Taylor Instrument Companies.
Recording
The Gas Machinery Co.
Taylor Instrument Companies.
United Engineers & Constructors, Inc.

RADIATORS
Gas Steam
American Gas Products Corp.

RANGES—GAS
American Stove Co.

RECORDERS—LIQUID LEVEL
The Brown Instrument Co.

RECORDING DEMAND METERS
The Brown Instrument Co.
Lambert Meter Co.
Maryland Meter Works

REFRACTORY CEMENTS
Botfield Refractories Company
The Gas Machinery Co.
General Refractories Co.
Improved Equipment—Russell Engineering Corp.
E. J. Lavino & Co.
Quigley Furnace Spec. Co. Inc.
United States Refractories Corp.

REFRACTORY GUN
Botfield Refractories Company
Quigley Furnace Spec. Co. Inc.

REFRACTORY LININGS
Alpha-Lux Company
Botfield Refractories Company
The Gas Machinery Co.
General Refractories Co.
Improved Equipment—Russell Engineering Corp.
Quigley Furnace Spec. Co. Inc.
United Engineers & Constructors Inc.
The Western Gas Construction Company
United States Refractories Corp.

REFRIGERATORS—GAS
Servel Sales, Inc.

REGULATORS
American Meter Co.
The Brown Instrument Co.
The Chaplin Fulton Mfg. Co.
Connersville Co., The
Connelly Iron Sponge & Governor Co.
Groble Gas Regulator Co.
Isbell-Porter Co.
Pittsburgh Equitable Meter Co.
Reynolds Gas Regulator Co.
Robertshaw Thermostat Co.
Smoot Engineering Corp.
The Sprague Meter Co.
Taylor Instrument Companies
Air Pressure
Time-O-Stat Controls Co.
Smoot Engineering Corp.
Coke Oven Suction Main
Smoot Engineering Corp.
Exhauster
Smoot Engineering Corp.
Furnace Pressure
Smoot Engineering Corp.
Oven
American Stove Co.
Steam Pressure
Smoot Engineering Corp.

REPAIR PARTS
Lambert Meter Co.

RESPERATING OUTFITS
Connelly Iron Sponge & Governor Co.

RETORTS
Horizontal and Inclined
Improved Equipment—Russell Engineering Corp.
Vertical
United Engineers & Constructors Inc.
West Gas Improvement Co.
Silica and Clay
Improved Equipment—Russell Engineering Corp.
The Gas Machinery Company
United States Refractories Corp.

RETORT CEMENT
Alpha-Lux Company
Botfield Refractories Company
The Gas Machinery Co.
Improved Equipment—Russell Engineer Corp.
Quigley Furnace Spec. Co. Inc.
United States Refractories Corp.

REVERSE FLOW GOVERNORS
Connelly Iron Sponge & Governor Co.

REYNOLDS
District
Reynolds Gas Regulator Co.

RUBBER AND JUTE JOINTING MATERIALS
Southwestern Pipe Joint & Eng. Co. Inc.

SAFES
Remington Rand Inc.

SAFETY VALVES
Connelly Iron Sponge & Governor Co.

SCREENS, ELECTRIC VIBRATING
C. W. Hunt Co. Inc.

SCRUBBERS
Bartlett Hayward Co.
Cruse-Kemper Company
Gas Engineering Co.
The Gas Machinery Co.
Isbell-Porter Co.
Semet-Solvay Engineering Corp.
Stacey Bros. Gas Const. Co.
The Stacey Mfg. Co.
West Gas Improvement Co.
The Western Gas Construction Company

SERVICE BOXES
The Stacey Mfg. Co.

SERVICE CLEANERS
American Meter Co.
Superior Meter Co.

SERVICE PLUG-RUBBER
Connelly Iron Sponge & Governor Co.
Safety Gas Main Stopper Co.

SHELVING (Steel)
Remington Rand Inc.

SKIP HOIST
C. W. Hunt Co. Inc.

SPECIFIC GRAVITY APPARATUS
American Meter Co.

SPECIFIC GRAVITY GAUGES
Alpha-Lux Company.

SPONGE
Alpha-Lux Company
Connelly Iron Sponge & Governor Co.
Gas Purifying Materials Co. Inc.

SPRAYS, for Water Gas Machines
Semet-Solvay Engineering Corp.

STACEY BULLETT for High Pressure Storage
Stacey Bros. Gas Construction Co.

STATION METERS (See Meters Station)

STEAM ACCUMULATORS
(See Accumulators—Steam)
The Gas Machinery Co.
Smoot Engineering Corp.
United Engineers & Constructors Inc.
The Western Gas Construction Company

STOPPERS
Safety Gas Main Stopper Co.

STRAINERS—GAS, STEAM, WATER
Andale Company

STREET DEPT. EQUIPMENT
American Meter Co.
Connelly Iron Sponge & Governor Co.
Safety Gas Main Stopper Co.

STREET LAMPS
Welsbach Street Lighting Co.

SULPHUR AND AMMONIA TEST (Apparatus)
American Meter Co.

SYSTEMS
Combustion Control
The C. M. Kemp Mfg. Co.
Smoot Engineering Corp.
Hot Water Heat Control
The Cleveland Heater Company
Time-O-Stat Controls Co.

TABULATING MACHINES
Remington Rand, Inc.

TACHOMETERS
Brown Instrument Co., The
The Bristol Company.
Consolidated Ashcroft Hancock Co., Inc.
Precision Thermometer & Instrument Company.

TANK REGULATORS
Reynolds Gas Regulator Co.

TANKS
Bartlett-Hayward Co.
Cruse-Kemper Company.
Gas Engineering Co.
Semet-Solvay Engineering Corp.
A. O. Smith Corp.
The Stacey Mfg. Co.
The Western Gas Construction Company.
Gas, Oil, Storage
Stacey Bros. Gas Const. Co.
High Pressure
The Gas Machinery Co.
Riter-Conley Company.
Stacey Bros. Gas Const. Co.

TAPE SOAP—BINDING
Safety Gas Main Stopper Co.

TAR DISTILLING PLANTS
Indugas, Inc.
Gas Engineering Co.
The Gas Machinery Co.
Semet-Solvay Engineering Corp.
West Gas Improvement Co.

TAR DISPLACEMENT SYSTEM
The Gas Machinery Co.

TAR EXTRACTORS
Bartlett-Hayward Co.
Gas Engineering Co.
The Gas Machinery Co.
Isbell-Porter Co.
Semet-Solvay Engineering Corp.
West Gas Improvement Co.
The Western Gas Construction Company.
United Engineers & Constructors, Inc.

TEMPERATURE CONTROLING DEVICE—Oven
American Stove Co.
The Bristol Company.
Brown Instrument Co., The
Consolidated Ashcroft Hancock Co., Inc.
Robertshaw Thermostat Co.
Tagliabue Mfg. Co., C. J.
Taylor Instrument Companies.
Time-O-Stat Controls Co.

TESTING APPARATUS, GAS
American Meter Co.
Pittsburgh Equitable Meter Co.
Precision Thermometer & Instrument Company.

THERMOMETERS
American Meter Co.
The Bristol Company.
Brown Instrument Co., The
Lambert Meter Co.
D. McDonald & Co.
Metric Metal Works.
Precision Thermometer & Instrument Company.
Superior Meter Co.
Taylor Instrument Companies.

THERMOSTATS
The Bristol Company.
Brown Instrument Co., The
The Cleveland Heater Company.
Consolidated Ashcroft Hancock Co., Inc.,
Precision Thermometer & Instrument Company.
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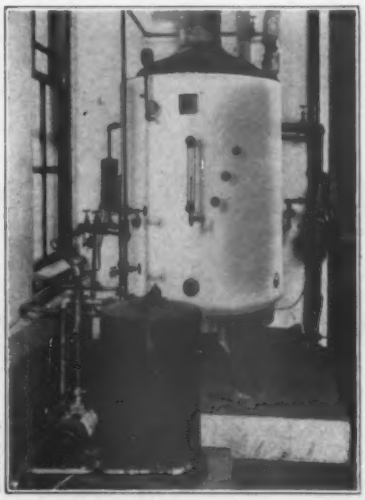

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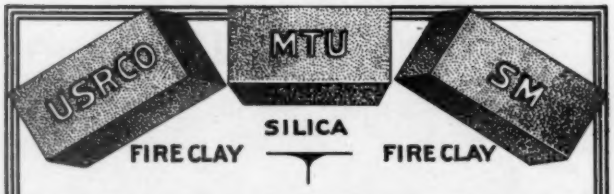

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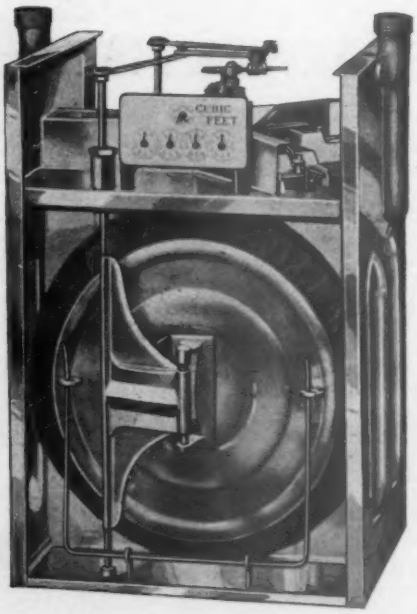

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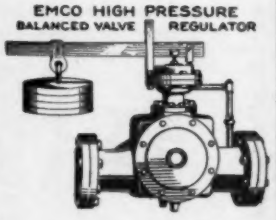

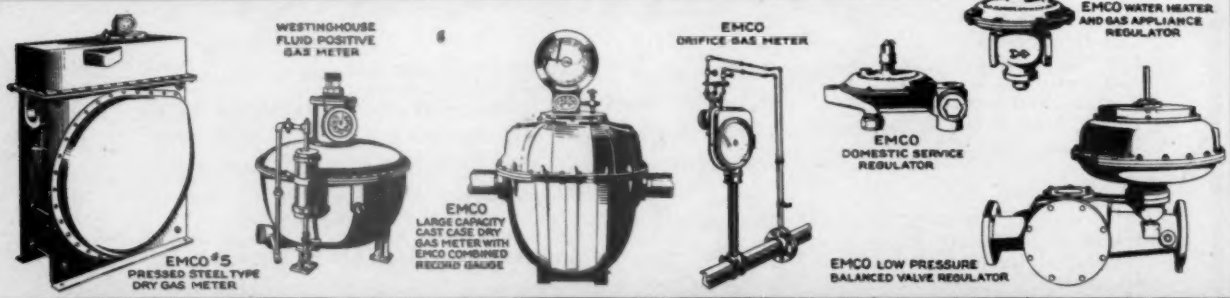

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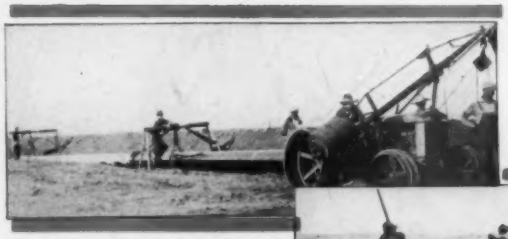

On the Amarillo-Denver line 87% of the protective coatings used were *Bitumastic* products.

Four hundred miles (95%) of the Empire Line between Pampa, Texas and Kansas City, are coated with *Bitumastic Enamel.*

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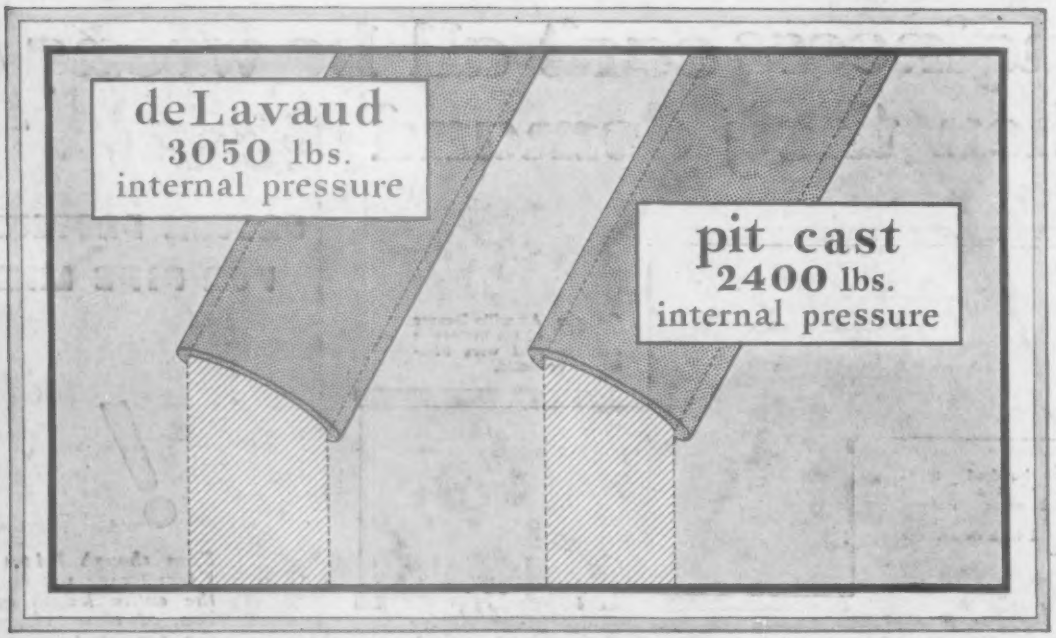

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THE diagram shown above graphically tells the story of deLavaud's superiority over pit cast pipe. These two sections have precisely the same outside diameter. Note, however, that the deLavaud pipe has a greater inside diameter and therefore a greater carrying capacity. Yet, *exhaustive tests have proved that deLavaud pipe is more than 25% stronger* than any pit cast iron pipe.

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